

THE IRON AGE

THURSDAY MARCH 24, 1892.

United States Naval Steam Cutters.

Our naval steam cutters are built to withstand hard, rough usage. They are strong enough to be lowered or hoisted, with steam up, bunkers full of coal, the tanks full of water and everything in readiness for instant service. They must also be good sea boats and able to steam

Engines.

The engines are designed to run at about 300 revolutions per minute, with steam carried at 160 pounds pressure. They are of the compound vertical type, as shown in Figs. 1, 2, 3 and 5. The cast-iron cylinders are mounted on turned steel columns. The latter are stiffened by four horizontal steel tie rods, one of which is made larger and supports the lower end of the girder. Vibration of the cylinders is

forged in one piece. The connecting rod is forked and the wrist pin turns in a bushing inserted in the crosshead. An ingenious device permits the removal of the wrist pin at any time. The ends of the pins are coned, the bases being the same size as the wearing surface of the pin and joined to it. A ring is then turned to fit the eye of the connecting rod (which is bored out parallel) and bored out to fit the coned ends of the pin. Care is taken to fit this ring so that it will not

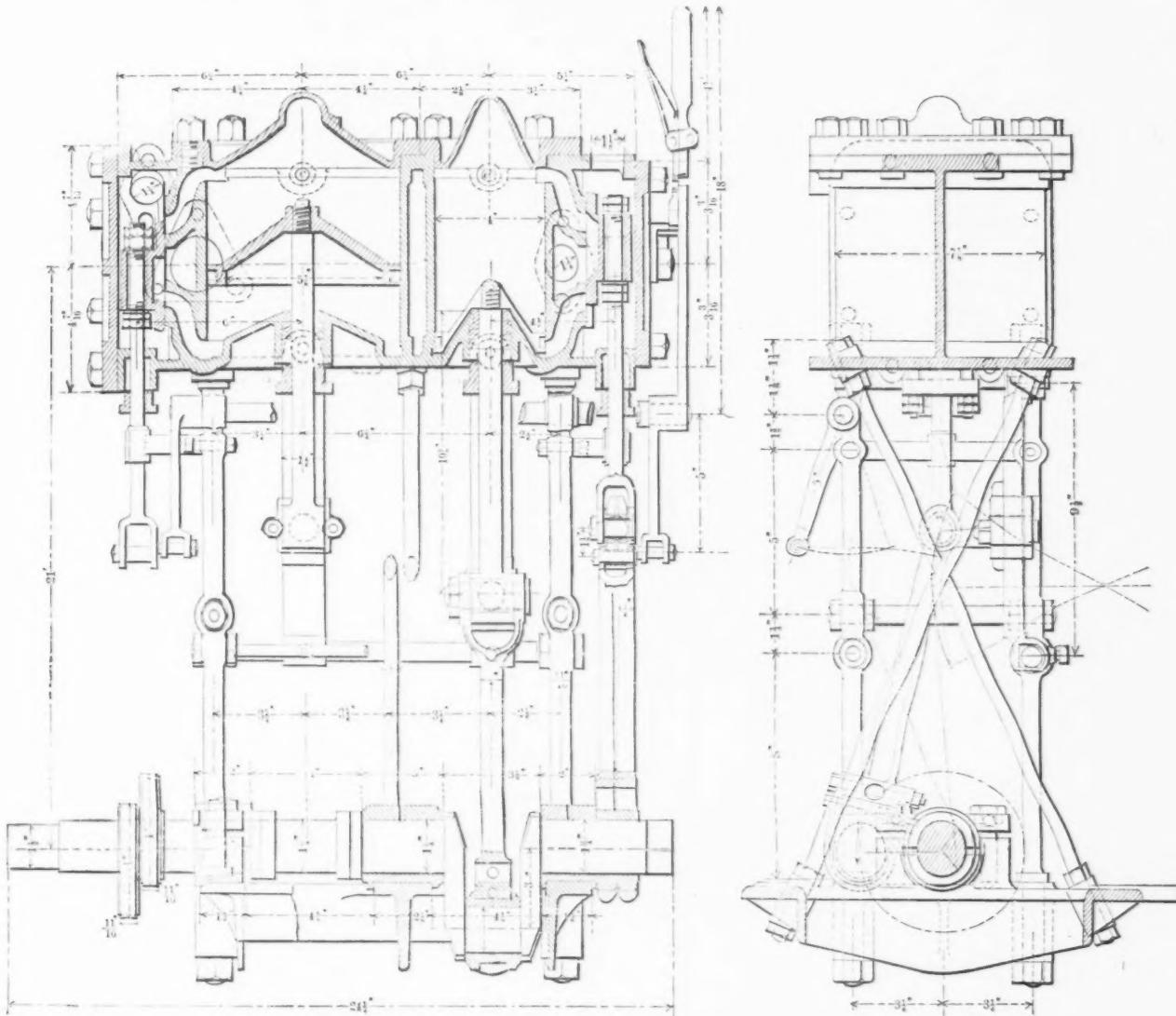


Fig. 1.—Sectional Elevation.

Fig. 2.—End Elevation.

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with safety for long distances through rough water. These requirements call for rather heavy, broad, well-built boats. It is also necessary to keep the machinery as low as possible to give these boats the required stability without making them so broad as to interfere too seriously with their speed. The speed is in a measure sacrificed for other more necessary qualifications, but by careful designing and the use of only the best material in the machinery of these boats it is possible to get a fair rate of speed. Under the ordinary conditions of service these boats will make from $7\frac{1}{2}$ to 8 knots per hour. The machinery of the new 28 and 30 foot steam cutters are very similar, differing chiefly in size.

prevented by two diagonal steel braces connecting the cylinder castings at the bottom near the middle on each side with the opposite side of the bed plate. This form of framing is light and allows free access to all the working parts. Actual service has shown this framing to be amply strong and rigid. The valves are of the ordinary three ported slide valve pattern, driven by the Stephenson link motion, Fig. 5, in the usual manner. The pistons are made of composition packed with a cast-iron ring sprung into a groove turned in the face of the piston. The piston rod is screwed into the piston and held by a pin. The piston-rod stuffing boxes are filled with metallic packing. The piston rod and crosshead are

go on to the pin quite far enough to be flush with the side of the connecting rod. The ring is now split in one place. A nut on each end of the pin forces this ring into the eye of the connecting rod, centering the pin, and holding it perfectly rigid. This arrangement allows the pin to be trued up in the lathe whenever necessary without affecting its fit in the connecting rod. As the wearing surface of the pin is always the largest part, there is no trouble in making the pin fit the new and smaller bushings. The connecting rods are made larger at the bottom than the top. The crank-pin brasses are secured by strap and bolts, the adjustments for wear being made by a sliding wedge worked by a screw. Especial pains are

taken to make all the moving parts as light as possible, so that the engines will run smoothly at high speed, although the steam follows nearly full stroke.

The crank shafts are made of wrought steel. All the bearings except the crank pin and shaft are fitted with brass bushings. When worn these bushings are

the pins are of hardened steel. The eccentrics are of cast iron with brass straps. There are two thrust rings forged on the shaft working in a brass bearing adjustable in a fore and aft direction.

Screws.

The screws are true helices. The blades are made rather broad at the points,

Condenser.

The exhaust steam is condensed in a keel condenser formed by running a copper pipe along the keel of the boat on one side, around the stern post and up the other side to the air pump.

The air pump is driven from the low-pressure crosshead by a beam having un-

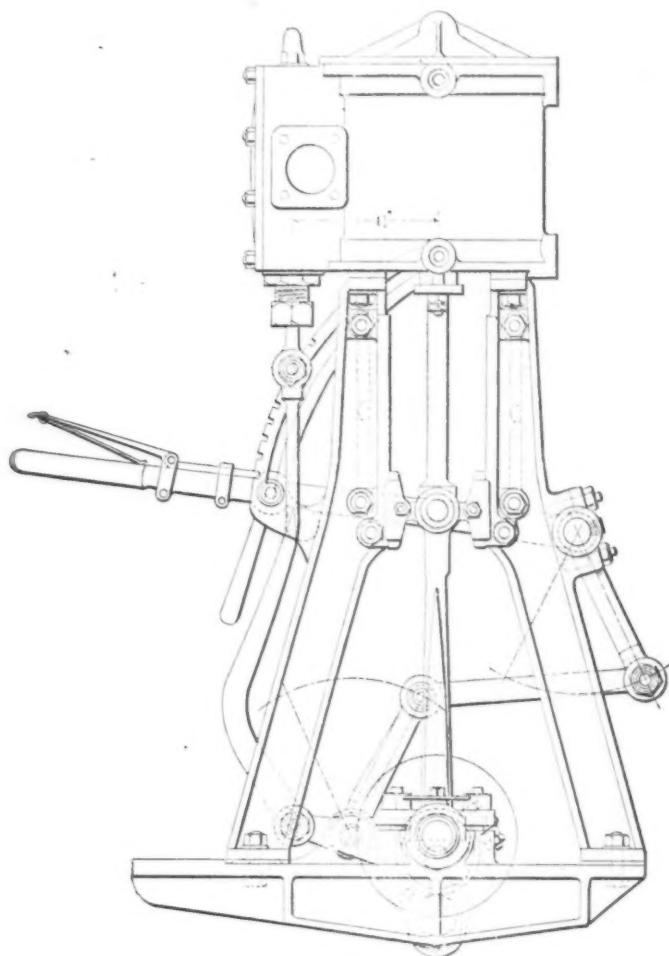


Fig. 3.—End Elevation.

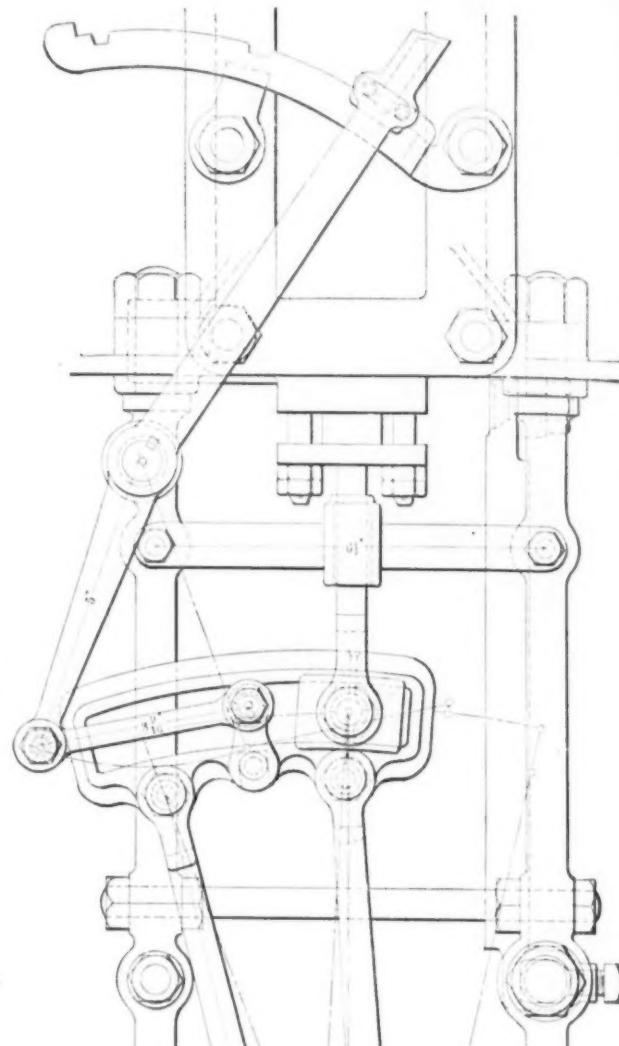


Fig. 4.—Plan at Cranks.

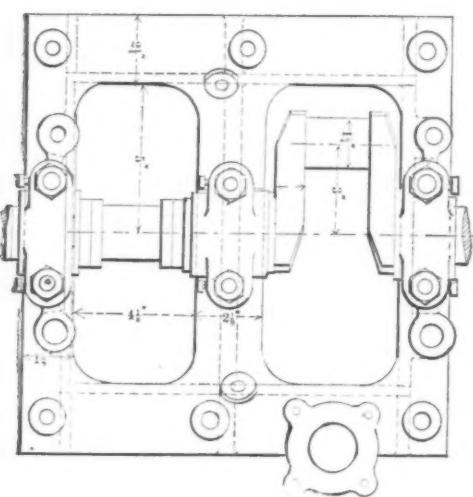


Fig. 5.—Elevation Showing Stephenson Link Motion.

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simply driven out and replaced by new ones. This reduces the number of small parts liable to get loose and out of order, and upon the whole gives more satisfaction than adjustable bearings. All

in order to get sufficient surface with a given diameter. The after part of the driving surface of the blade, near the hub, is cut away somewhat, to allow the water to flow more freely through the screw. equal arms, thus reducing its stroke to one-quarter that of the engine. The valves are of metal with light springs on top. A maximum lift of $\frac{1}{4}$ inch is all that is allowed. Only water packing is used

around the piston, small grooves being turned for this purpose. This pump is very reliable and produces a vacuum of from 18 to 22 inches of mercury.

The condensed water is filtered before going to the feed pump. The filter con-

sists of a rectangular grate surrounded by a water box on all sides. Over the grate in alternate inclined rows, running from side to side of the boiler, are water tubes, the sides of the boiler forming the tube sheets. The outer shell, opposite the ends

pose of deflecting the entering water and preventing it from entering the steam pipe, which is further protected by a dry pipe at the top of the drum. The end of the drum opposite the furnace door is connected with the bottom of the water box by two large down-draft pipes. This arrangement secures good circulation; for the solid water in the drum draft pipes, being heavier than the mixed water and steam in the boiler, causes the water to flow down these pipes into the water box and thence through the inclined and horizontal tubes into the drum. This boiler has a large grate in proportion to the floor space occupied, and steams freely with natural draft. Under strong forced draft the boiler furnishes dry steam and is reasonably economical of coal. They have been used in the navy for about three years and have given thorough satisfaction. Another great advantage as a boat boiler is their low center of gravity. They

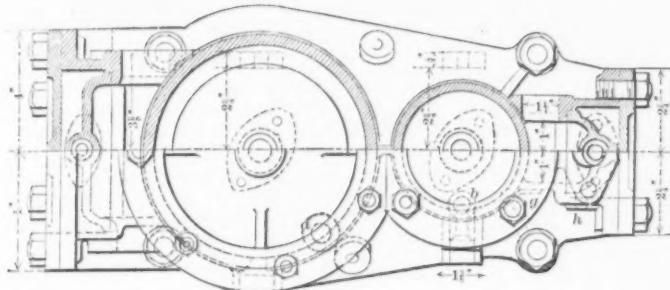


Fig. 6.—Plan of Engines.

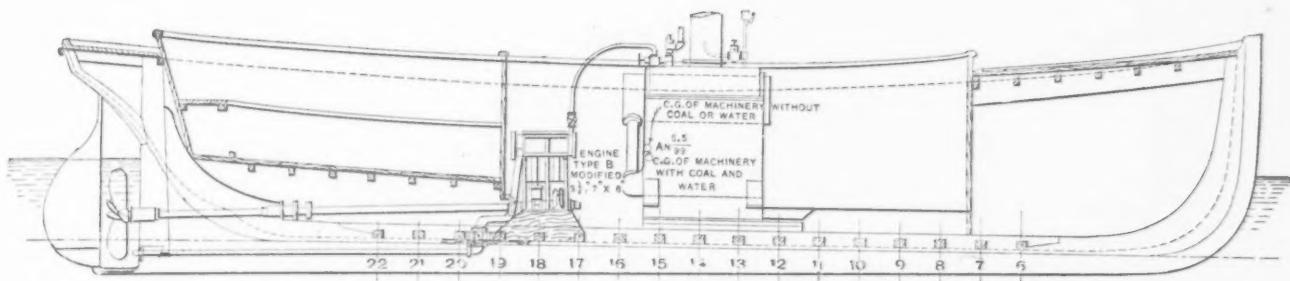


Fig. 7.—Longitudinal Vertical Section of Hull.

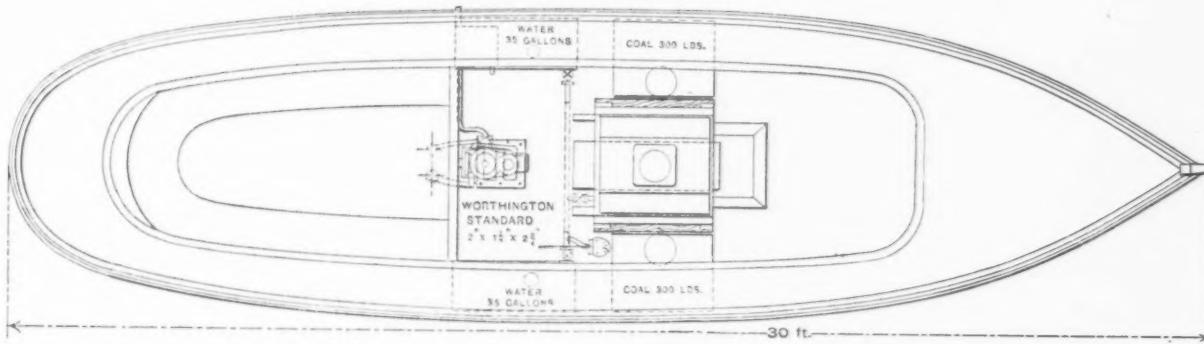


Fig. 8.—Plan of Hull.

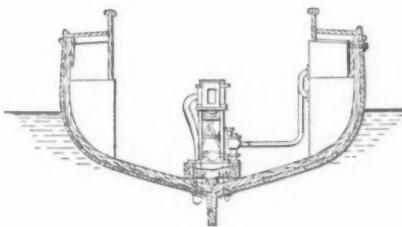


Fig. 9.—Cross Section through Machinery Space.

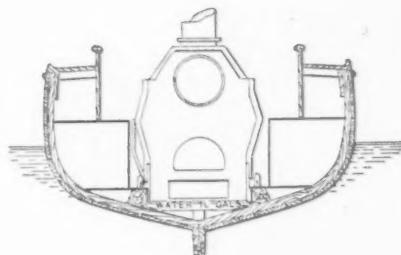


Fig. 10.—Cross Section through Boiler Space.

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sists of a rectangular box, partially filled with sponges, and provided with suitably arranged diaphragms to prevent the oil and dirt from going to the feed pump.

Independent feed pumps are used. Vertical duplex pumps take up but little room and give the best satisfaction.

Boilers.

The boiler used in these boats is known as the Towne patent boiler, which we have described in former issues. It con-

of the tubes, is fitted with screw plugs filling the holes through which the tubes are put in and expanded into place. Laying across the top of the boiler, in the crotch formed by the inclined tubes, is placed the steam drum, extending beyond the end of the boiler. It is connected to the top of the water box by 18 horizontal tubes $\frac{1}{4}$ inch inside diameter. The inside of the drum is fitted with a deflecting plate over the mouths of the entering tubes, and with curved diaphragms for the pur-

are designed for a working pressure of 160 pounds per square incn.

Dimensions of 28 and 30 Foot United States Naval Steam Cutters.

Hulls:	28 ft.	30 ft.
Length, extreme.....	28 ft.	30 ft.
Breadth.....	7 ft. 8 in.	7 ft. 9 in.
Depth.....	4 ft.	4 ft. 1 $\frac{1}{2}$ in.
Draft forward.....	2 ft. 6 in.	2 ft. 5 in.
Draft aft.....	3 ft. 4 in.	2 ft. 10 in.
Displacement.....		
Diam. of H.P. cylinders.....	3 $\frac{1}{2}$ in.	3 $\frac{1}{2}$ in.
Diam. of L.P. cylinders.....	7 in.	7 in.
Stroke of piston.....	5 in.	6 in.
Area of H.P. steam port.....	1.25 sq. in.	1.25 sq. in.
Area of H. P. exhaust port.....	2.25 sq. in.	2.25 sq. in.
Steam lap H.P. valve.....	Top. Bot. Top. Bot.	Top. Bot. Top. Bot.
Exhaust lap H.P. valve.....	inch. inch. inch. inch.	inch. inch. inch. inch.
Area of L.P. steam port.....	5.06 sq. in.	5.06 sq. in.
Area of L.P. exhaust port.....	inch. inch. inch. inch.	inch. inch. inch. inch.
Steam lap L. P. valve.....	7/16 0	7/16 0
Exhaust lap L.P. valve.....	2.81 sq. in.	2.81 sq. in.
Steam lead H.P. valve.....	5/16 3/8	7/16 3/8
Steam lead L.P. valve.....	3/16 1/2	5/16 1/2
Travel of each main valve.....	5/16 0	5/16 0
Total clearances in both ends of each cylinder.....	14 in.	14 in.
Diameter of piston rods.....	3/4 in.	3/4 in.
Diameter of valve stems.....	1/2 in.	1/2 in.
Length of connecting rod.....	12 $\frac{1}{2}$ in.	12 in.
Diameter of wrist pins.....	7/8 in.	7/8 in.
Length of wrist pins.....	1 $\frac{1}{2}$ in.	1 $\frac{1}{2}$ in.

Diameter of crank-shaft and crank-pin journals	1 3/4 in.	1 3/4 in.
Length of crank pins...	2 in.	H.P. 2 1/4 in. L.P. 2 1/4 in.
Length of forward and after crank-shaft journals	2 in.	2 in.
Length of middle crank-shaft journal ...	3 in.	3 in.
Diameter of line shaft...	1 1/4 in.	1 1/4 in.
Diameter of thrust rings	2 1/2 in.	2 1/2 in.
Total area of thrust surface ...	9.7 sq.in.	9.7 sq.in.
Diameter of propeller shaft, includ'g casing	9.7 sq.in.	9.7 sq.in.
Diameter of screw ...	1 1/2 in.	1 1/2 in.
Pitch of screw ...	26 in.	27 in.
Helicoidal area...	36 in.	48 in.
Projected area...	338 sq.in.	319 sq.in.
Air Pump:	258 sq.in.	223 sq.in.
Diameter of plunger...	2 in.	2 in.
Stroke of plunger...	1 1/4 in.	1 1/4 in.
Boiler:	53/4 sq. ft.	5 1/2 sq. ft.
Grate surface.....	80 sq. ft.	99 sq. ft.
Heating surface.....	3 ft. 6 1/4 in.	3 ft. 7 1/2 in.
Ratio of grate to heating surface	2 ft. 7 1/2 in.	2 ft. 10 1/2 in.
Length of boiler overall	3 ft. 2 1/4 in.	3 ft. 10 in.
Width of boiler...		
Height of boiler from bottom of ash pan to top of casing... .		
Weights of Mach'y:		
Engine, pumps, shafting and propeller....	732	850
Boiler with water and all attachments in steaming condition...	1747	2.95
Bunkers, tanks, floor plates, tools, &c....	511	570
Coal ...	500	600
Water ...	64	640
Total fully equipped for service ...	4354	4955

The Alloys of Iron and Titanium.

BY J. B. NAU, NEW YORK.

Titanium is found, and even often in large quantities, in many iron ores. Thus a magnetic ore from Ultö in the Archipelago of Augermanland, contains, according to analysis by Dr. A. Tamm, 9.51 per cent. of TiO_2 . Fernquist found in a magnetite from Taberg, near Jönköping, 6.30 per cent., and in another ore from Longhult Mine in Smaland, 8.5 per cent. TiO_2 . Finally in similar ore from Tuglamola in the same province, 5 per cent. of TiO_2 were discovered. Titanium is difficult to reduce and by far the largest part of it in the ore goes to the cinder in the blast furnace, giving to the slag a dark and sometimes a perfectly black color, while it is generally very difficult to find only as much as traces of it in the pig iron produced. J. E. Eklund, in an analysis made at the School of Mines at Stockholm, found scarcely traces of titanium in pig iron obtained with titaniferous ores from Taberg, while the accompanying slag contained on the contrary 8.55 per cent. of TiO_2 ; in another blast furnace cinder obtained with the same ore, 10 per cent. of TiO_2 were discovered.

A test made by Professor Eggertz, with titaniferous ores, in order to obtain titanic iron, was a failure; another test, made in Percy's laboratory, with a view to obtain titaniferous irons, consisting in smelting together in a graphite crucible oxide of iron and finely pulverized titanic acid, was unsuccessfully made. The globule of iron obtained contained no titanium. On the other hand, Sefström after having heated in a graphite crucible at a high temperature, first a mixture of oxide of iron and TiO_2 , and then a similar mixture with an addition of a certain proportion of bisilicate of lime, obtained a pig iron with a high percentage of titanium. In the first case he obtained a very hard, though forgeable, iron with 4.78 per cent. of titanium, whereas, in the last case a velvet dark soft iron with 2.2 per cent. of titanium was obtained. In a third test, similar to the second one, an unforgeable white and hard pig iron with 0.5 per cent. of titanium was obtained. Some of Mr. Riley's analyses also show that the same element is sometimes found in pig iron that has

been made by the ordinary methods. He found that with a blast furnace mixture into which a certain proportion of Irish titaniferous bog ore entered, pig iron was produced with from 0.5 to 1.6 per cent. of metallic titanium. Furthermore, Raumselsberg discovered in a spiegeleisen from Lohhütte in Müsen a small amount of titanium, and finally Karsten states that in many varieties of pig iron traces of titanium can be found.

Besides, without mentioning the presence of this metal in blast furnace slags, titanium is found in the shape of copper-colored compounds, either attached to the side walls of the blast furnace or incorporated in the pig iron salamanders or even imprisoned in the slag itself. Formerly this compound was taken to be metallic titanium, but later Wöhler established that it was a cyano-nitrate of titanium, represented by the formula $TiC_2N_3 + 3Fe_2N_2$. This compound, according to Fickens, is volatile at a high temperature, and its appearance in the blast furnace is said by Wöhler to be simultaneous with the formation of cyanide of potassium.

In the dry tests of titaniferous iron ores a copper red skin is very often observed between slag and iron, and sometimes even surrounding both. This appearance is certainly due to the presence of the above mentioned compound. Furthermore, Karsten observed in some kinds of pig iron small red grains, whose presence, however, was exclusively noticed in titaniferous irons. Based on this observation, Karsten doubts whether iron and titanium enter into a really chemical combination.

As already stated, titaniferous ores are very difficult to reduce, so that with a dry test the amount of fuel required will be much larger than in the case of ordinary ores, and this circumstance can perhaps be explained, in supposing TiO_2 renders the reduction of such ores more difficult, inasmuch as this element strives to retain in combination part of the oxide of iron. After smelting several times in succession in a graphite crucible the black scores obtained in the dry treatment of titaniferous iron ores, J. Akerman reduced each time a pig-iron globule, while the resulting slag remained equally dark. It is remarkable that titaniferous ores can be smelted with the same result in a graphite crucible either in the presence of a flux of lime or in presence of quartz.

Titanates are difficult to smelt, hence metallic titanium renders the smelting of the iron difficult. It is believed, however, that the presence of titaniferous ores is favorable to the formation of spiegeleisen. This cannot be considered as absolutely true, but it is a fact that spiegeleisen is obtained very easily from Taberg ores, notwithstanding their small percentage of manganese (0.4 per cent. of MnO); these ores, besides containing 18.3 per cent. of MgO and only 31.5 per cent. of iron, differ from Swedish ores only through the presence of a small amount of vanadium and a large amount of titanium. Of course, sometimes a larger amount of manganese than the one above referred to is found in Taberg ores; but that the fitness of these ores to the production of spiegeleisen depends upon other causes than the presence of manganese may be said to be established by the fact that two pieces of spiegeleisen from two different works in the Taberg district, analyzed at the School of Mines in Stockholm, contained only respectively 0.15 and 0.2 per cent. of manganese. Hence it seems probable that the presence of vanadium or titanium is the cause why spiegeleisen can be produced so easily from these ores.

Ores from Ultö, on account of their difficult reduction, have been used to a small extent only, and as far as I know, no spiegeleisen has been made with them; however, tests made by Clason showed

that white iron can be obtained with them. In this experiment it was proven that whenever 19.4 per cent. of the basic mixture, which previously gave forth gray iron (in the blast furnace at Bolsta), were replaced by Ultö ores, the pig iron obtained became white with only a few gray specks strewn in the mass. Therefore, it may be supposed that titanium favors the tendency of the iron to combine with carbon. If this is really the cause of the above named occurrence, the action of the titanium must be a very strong one, because in the different varieties of pig iron produced by this method, not a trace of that substance could be discovered. Whatever may be its action, it has been observed that in the variety of spiegeleisen from Taberg, not more carbon was found than in the ordinary white charcoal iron, and that this iron was not brittle like ordinary spiegeleisen, but that, on the contrary, it was broken only with great difficulty.

Considering the difficulties of the reduction of titanium and its tendency to unite with oxygen, it is probable that the titanium, which is sometimes found in pig iron, disappears completely during the refining of the iron. According to my knowledge, no titanium was ever found in soft iron (wrought iron).

By the fusion of 99 per cent. of steel and 1 per cent. of metallic titanium, Karsten obtained an exceedingly good steel, of which the tenure in titanium, however, varied greatly, and he discovered in this circumstance another proof that iron and titanium in the metallic state do not enter into any chemical combination, but that they are only mechanically mixed. The steel made in this test, after having been polished and subjected to the action of acid, presented a beautiful damasked appearance.

Both Faraday and Stodart tried to obtain titaniferous steel by smelting together in one case steel shavings and a mixture of charcoal and titanic acid; in another case steel shavings with a mixture of charcoal and titaniferous iron sand. In both cases a good steel was obtained, which could be made to take a damasked appearance, but not a trace of titanium could be discovered in it, although a very high temperature had been used in its production.

These experiments seem to prove that it will be possible only in exceptional cases to reduce metallic titanium from a mixture of titanic acid, oxide of iron and charcoal. It is true that tests have been made to produce titanium steel, by the smelting of compounds of titanic acid with charcoal and iron, but Percy states that many well-known chemists failed to find any titanium in this metal, and without trying to decide the question, I can add that I, myself, never discovered any titanium in such steel. The same thing may be said of Mr. Riley, who took so much trouble in the determination of titanium, and who really discovered such high amounts of this substance in certain varieties of steel.

The great importance that was attributed to the question of titanium can be best seen in the fact that the superiority of Danemora iron and other brands of iron was solely attributed to the presence of titanium in the ores used in their production, whereas as far as I know it is a fact that neither Danemora ores nor any other Swedish ores from which these celebrated iron and steel are manufactured contain titanium.

From the above-stated facts the conclusion may be drawn that if titanium has any noticeable advantage in the production of steel, its influence on the qualities of iron must be so powerful that even small amounts hardly detected by analysis make themselves felt; this is in some manner strengthened by the adaptability of Taberg ores to the production of spiegeleisen, or the influence of titanium is indirect, consisting in the elimination of some obnox-

ious elements from the steel. This may be the case, at least as far as sulphur is concerned; it has indeed been noticed that in such blast furnaces where Ulfö ores are treated the addition of only 10 per cent. of titaniferous ores to the mixture reduces considerably the danger of red shortness. The same blast furnaces claim also that titanium purifies from phosphorus, but to my knowledge there exists no fact which can prove this. On the other hand, the partial elimination of phosphorus is contradicted by the fact that Dr. A. Tamm discovered in pig iron obtained in a dry test at the School of Mines in Stockholm the whole amount of phosphorus that had existed in the ore. But this amount was so small (the ores contained only 0.07 per cent. of phosphoric acid) that no conclusion can be drawn from these experiments.

As can be seen in the foregoing, tests have been often and repeatedly made to reduce titaniferous ores and to incorporate titanium in iron or steel, though with varying success. This metal, as well as its acid, are sometimes difficult to detect in an iron ore, and an inexperienced chemist may overlook it in an ore where it exists in noticeable quantities. In a very able pamphlet on titanium and its acid in iron ores by A. J. Rossi, published some time since, it has been clearly shown that this element is met with in many ores in the United States. Some of them contain it in large amounts, and according to the before mentioned paper, many of them, where titanic acid reaches several per cent., have been treated very successfully in blast furnaces, yielding an excellent quality of pig iron. According to the same paper, ores with several hundredths of 1 per cent. of titanium are daily treated in many Eastern furnaces with best results.

The writer himself had occasion to treat for some time in a blast furnace a mixture of which 25 per cent. were furnished by puddle cinder with nearly 10 per cent. of titanic acid. In other words, the average amount of titanium in the whole mixture was about 2.5 to 3 per cent. The iron obtained was of superior quality for foundry purposes. The presence of too large an amount of phosphorus in the puddle cinder prevented our using it for Bessemer purposes. Not the least difficulty resulting from the presence of this high amount of titanic acid in the mixture was experienced in the blast furnace.

Whatever may be the possibility of reducing titaniferous ores cheaply in a blast furnace, and of incorporating a high amount of it in pig iron, there is no doubt that its presence in the iron is very beneficial. This metal, on account of its great affinity for oxygen, possesses undoubtedly great purifying qualities. Like silicon, aluminum and some other substances, the addition of such an element to a bath of molten steel or iron will decompose at once the oxide of iron formed and contained in the bath, and will consequently constitute a powerful preventive against red shortness and blowholes. This action will probably explain the beneficial effect that this metal has upon iron, as iron obtained from titaniferous ores is mostly of superior quality, even if no titanium is found in its composition.

Since steam users in the "natural gas" section have found it necessary to return from natural gas to the old method of using coal for fuel, it has caused a demand for all kinds of fuel-saving devices, principal among which are feed-water heaters and purifiers. Carnegie Brothers & Co., Limited, at Bessemer, Pa., have just contracted with James Berryman of 125 North Fourth street, Philadelphia, for 4000 horse-power of Standard Berryman feed-water heaters and purifiers, after using 20,000 horse-power at their various works during the past 14 years. He has, like-

wise, just received contract from the Pennsylvania Steel Company of Steelton, Pa., and the Maryland Steel Company at Sparrow's Point, Md., for 2750 horse-power, after using 18,000 horse-power during the past 16 years; from Oliver Brothers & Co. of Pittsburgh, for 3750 horse-power, after using 3000 horse power for 16 years; from the Johnson Company of Johnstown, Pa., for 1250 horse-power, after using 3100 horse-power during the past five years. A new branch office has been established by James Berryman at No. 12 Schmidt Building, 95 Fifth avenue, Pittsburgh, Pa.

Transmission of Motion.

From the *Stevens Indicator* we take the following extract from a lecture by Prof. Coleman Sellers in the Department of Engineering Practice. The lecturer stated that his first experience in the machine shop was in connection with a rolling mill, after which he was superintendent of one of the large locomotive shops of the West. He then continues:

Shaft Couplings.

After about five years' experience in this latter employment, I came East and took service with the then firm of William Sellers & Co., in Philadelphia, as their chief engineer. Now, it is to this particular firm that we are indebted for most of the improvements that have been introduced in the transmission of motion by means of line shafting and mill gearing in a very superior manner. They have been leaders to the highest condition of the art at the present time. They were the first to manufacture what is known as ball and socket or self-adjusting hangers, which enabled line shafting to be erected cheaply, and permitted the use of very long bearings for the shafts, much longer than was possible in ordinary rigid hangers.

The most serious trouble connected with the manufacture of line shafting lay in the difficulty of fitting couplings to the shafts, which couplings were to join the independent lengths into one long line. The coupling used at that time, and the only coupling used to any advantage, was that known as the plate coupling, which consisted of two flanged hubs, one-half of each coupling being permanently attached to the end of each shaft and the halves afterward united by bolts that had been carefully reamed to place so as to permit no possible motion at the point of juncture. An absolutely perfect coupling, for shafting calls for something that must be as strong if not stronger at the coupled joint as the body of the shaft. This is quite possible with the old plate coupling, provided the work is properly done and the couplings themselves are rightfully proportioned, but calls for very superior workmanship and great care in fitting. It necessitates, also, the use of open-sided or hook hangers, which will permit the separate lengths of shafting to be lifted into their bearings without the removal of the coupling.

Double Cone Vise Coupling.

Many engineers had worked on the problem of obtaining or inventing some coupling which should have all the qualities of the plate coupling, but yet would have the advantage of being easily removed and replaced. It so happened that it fell to me to be the one who originated the coupling that seemed to answer all the requirements, and the invention known as the double cone vise coupling, now so largely and generally used, and the basis of many attempts to imitate it, has been accepted as the standard of excellence as to qualities required in a coupling for line shafts.

The double cone vise coupling did away with the accurate hand work required with the old form of plate coupling, and permitted machine work to take its place. It claimed to be equally as rigid as the plate coupling, and yet be readily removed. It did not deteriorate under repeated removals, and, in fact, seemed to answer all the requirements called for.

The important service, however, done to the art of making shafting by the invention of this coupling was not confined to it alone. It enabled much improvement to be made in the form of hangers. It permitted the use of double-braced hangers—that is, hangers of the V form, which would carry the bearings with equal steadiness, and required much less metal in their construction, and yet permitted the ready removal of the shafts for repair or alterations of the pulleys on the line. The invention of these improved hangers, coming as they did with the coupling, permitted the manufacture of shafting to be taken up as a separate and distinct line of mechanical industry, and now there are many establishments in different parts of the country confining their work almost exclusively to supplying the wants of the community in reference to all that goes to make up the equipment of factories in shafting, couplings, hangers, pulleys and gearing.

Cincinnati as a Wood-Working Machinery Center.

In a recent interview with Thomas P. Egan, president of the Egan Company of Cincinnati, Ohio, one of the most extensive manufacturers of wood-working machinery in the world, there is stated the following: Cincinnati may well feel proud of her commanding position as a machinery manufacturer. In 1864, when I first went into this branch of machinery, the business was very small and very contracted. Not 200 men were engaged in it, and the machines were wood frames, and the most of them made to order as the operator wanted them. Now there are fully 5000 men in this and kindred lines, and the machines are all of iron and steel. The designs and improvements are superior to the world, and are sought after so that no foreign country or government but what stipulates in their requisition: "Machinery from Cincinnati or equal to it." It has been remarked that on account of the great reputation of two concerns in this city, they brought buyers from all parts of world and allowed several of the smaller concerns to grow up and improve.

We have the best facilities in Cincinnati for manufacturing. Coal and iron are cheaper than in any other city, material of all kinds easily obtained, and our workmen are all mostly the best class of Germans, and our great position gives us the benefit of lower freights to all points. I am personally acquainted with several manufacturers who were recently induced to change their location, and one and all of them admit that they made a mistake and wished themselves back in Cincinnati. In the recent flurry in Chili, the Government of the United States wanted a full outfit of machinery for the navy yard at Norfolk, Va., and wanted it at once. By special contract, Cincinnati again carried the day and filled the order for 32 machines made by the Egan Company. At Paris, Vienna and London the Cincinnati concerns carried off the honors. Our company have made application for 20,000 square feet of floor surface in Machinery Hall in order to display some 40 different machines of our own construction and origin, all in actual operation. Cincinnati as a machinery market, is now the largest in the world, and is becoming more and more expanded every day.

The Jarecki Pipe Machine.

We present front and rear views of the pipe machine built by the Jarecki Mfg. Company of Erie, Pa. The machine is driven by an engine secured to the frame, as shown in the rear view, the cylinder being 6 x 8 inches. The governor pulley is provided with steps for changing the speed of the engine. The fly wheel has a $3\frac{1}{2}$ -inch face for belting to a line shaft if desired for operating other machinery. The engine is so arranged that by the movement of a lever it can be disconnected from the pipe machine part. In order to reverse the engine for cutting left-hand threads, a set screw is loosened in the eccentric cam, which is then moved in the

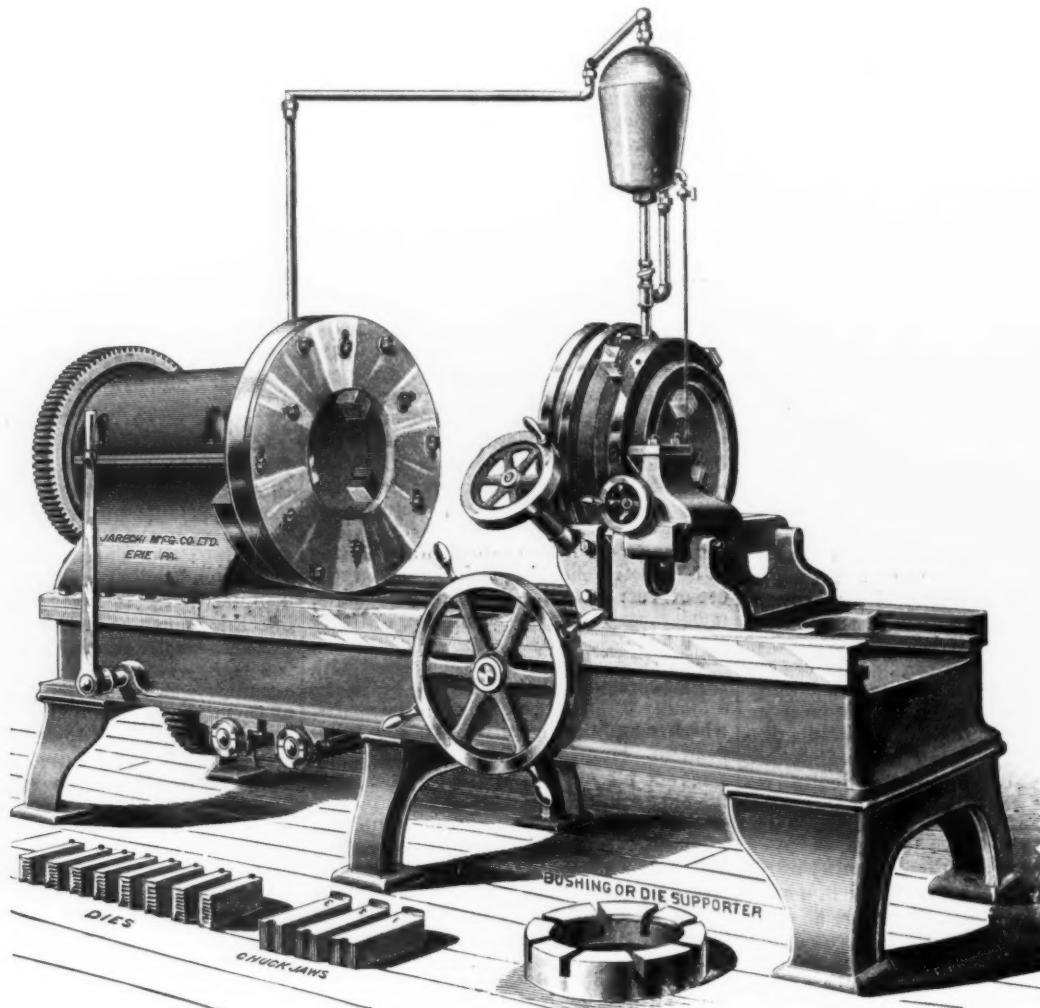
necessity of carefully resetting for every thread that is to be cut. With the vertical lever the speed can be changed instantly while running or the machine can be stopped. The pump insures a steady supply of oil to lubricate the dies and knife. On the back end of the spindle is an adjustable self-centering chuck to center the pipe; also the same on the die head to steady the pipe when being cut off. The gripping chuck is self-centering.

Zinc Rods in Boilers.

In a recent issue of the Journal of the American Chemical Society we find a description, by Charles E. Maurve, of some

boats, recommending that, in order to protect them from pitting, pieces of zinc be placed on the inside of the vessel at intervals of from 5 to 6 feet apart from stem to stern and as low down as possible, so that they may be immersed in any bilge water present, and so fastened as to be in metallic contact with the frames of the vessel.

Usually zinc for boilers is employed in the form of plates which are suspended in the boiler, and this is the form in which it is used in the separator of the Cushing's boiler, but it is introduced into the wing cylinders, which are 14 inches internal diameter by 8 feet in length, in the form of cylindrical rods $1\frac{3}{4}$ inches in diameter by 5 feet in length. These rods are squared



THE JARECKI PIPE MACHINE.—FRONT VIEW.

opposite direction to which the engine is to run.

The dies used in the machine are quick opening and adjustable. After the pipe has been threaded there is no backing off the dies as in the ordinary manner; all that is necessary is to open the dies and run the die head back. If the pipe is to be cut off the dies will expand far enough to admit of the pipe passing through them to the cutting-off knife. When the dies require sharpening they can be quickly removed and ground on any ordinary grindstone. The die head is also provided with an adjustable stop pin, which is very convenient when a large number of threads of the same size are to be cut. Ordinarily every time a thread is cut the dies must be carefully reset, but with this adjustable stop the dies are first set to the size to be threaded, then the stop is moved and secured, which will only allow the cam to move to the point required to thread the proper size without the

zinc rods which, after exposure to the action of hot water in the wing cylinders of the Thornycroft boilers on the United States torpedo boat Cushing, had become perforated throughout their entire length with a central canal. As, owing to the disastrous effect of scale in multitudinous boilers, soft water only can be used in them, it is essential to condense the exhausted steam; but as the condenser is made of tinned brass tubes with a copper shell, the electro-chemical action between the metals tends to pit and corrode the steel boiler. To prevent this, and also the pitting, zinc, which is electro-positive to the steel, is put in the boiler in such a way as to be in close metallic contact with it. This practice has been long in vogue for the protection of boilers, but more recently it has come into use for the preservation of the vessels themselves, Mr. Thornycroft in his "Instructions of March 15, 1889" for the care and preservation of the steel hulls of his torpedo

off for about 1 inch in length at each end, so as to fit in notches in a steel frame, from which they are suspended by their ends in the center of the wing cylinder. These rods have evidently been cast vertically, and when an unused one is fractured the exposed surface of the interior shows a mass of feather-like fretted crystals radiating in pyramidal groups from the center, but forming a compact mass, except for an occasional, but non-continuous, small cavity at the center. The exterior of the rod is of a dull blue color, and appears to have been chilled in casting. The rods had been exposed in the boiler for about two months, but the steam was on during this time for but 608 hours, the pressure varying from 50 to 250 pounds. When taken from the boiler these rods were found to have increased considerably in diameter; to have become oval in form; to be perforated throughout their entire length, with a hole at the center of somewhat irregular shape, and

varying in diameter from $\frac{1}{8}$ to $\frac{1}{4}$ inch; to be more or less corroded at intervals on the surface; to be bent down between the points of suspension, and to be so rotten as to easily break under their own weight. The increase in diameter varied from $\frac{1}{8}$ to $\frac{2}{3}$ inch.

From consideration of the circumstances I am of the opinion that the formation of the tubular canals in the rods is due to the fact that, as cast, the radiating crystalline mass is held in place by the outer envelope of metal which is produced by the contact of the exterior portion of the molten mass with the cooler walls of the mold, and that when, through the erosion or corrosion of this envelope by the rapidly circulating

days' steaming that sometimes only small fragments and sometimes no portion whatever of the zinc is found remaining in the boiler at the end of this time. I have had no opportunity of learning what becomes of this mass, as the Cushing was put out of commission when my attention was called to the matter.

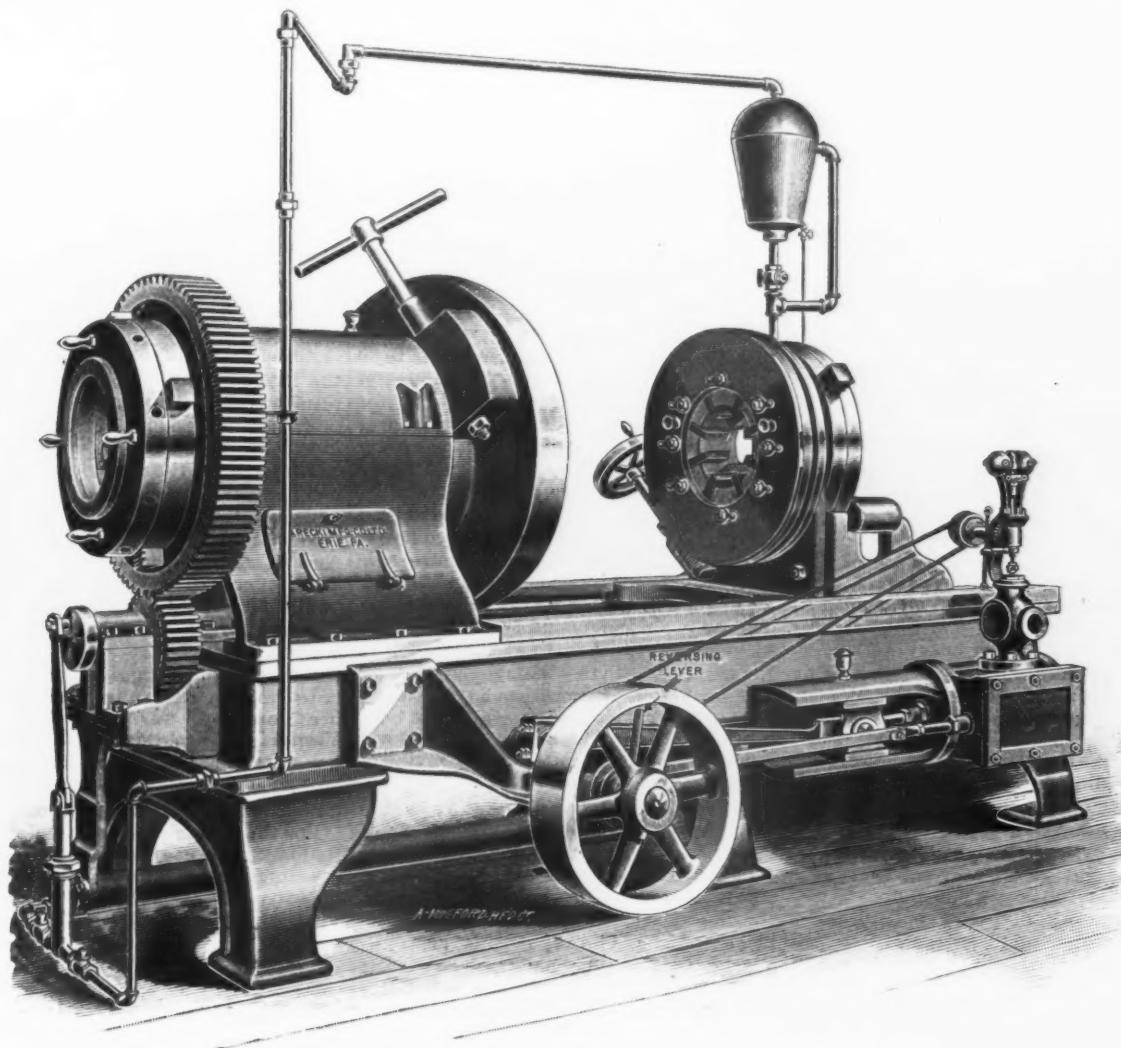
The Niles Tool Works.

From a very handsomely illustrated catalogue descriptive of the many machines made by the Niles Tool Works of Hamilton, Ohio, we take the following brief ac-

road track, which permits the loading of heavy machines on cars direct by means of the traveling cranes.

The third section, 40 feet wide, is the fitting shop. In it are the vises, scraping benches, surface plates, and all tools and appliances peculiar to this department. This room is also supplied with overhead traveling cranes of 3 to 10 tons capacity. Part of this shop is occupied by the tool room, which is thoroughly equipped with the most modern machinery for making and repairing tools. It is furnished with standard gauges and templets and a very full assortment of tools.

The next section is 36 feet wide and also 32 feet high under the trusses. It



THE JARECKI PIPE MACHINE.—REAR VIEW.

heated water, the tension is removed, the crystals are free to move over one another; and that when cooled from the high temperature to which they have attained the bundles of crystals contract along the transverse axis of the rod, away from the center, and since there is no longer a contracting, continuous exterior envelope to bring them back to their original positions the canals result. The oval form which the rods assume is due to the action of the force of gravitation at the time when the force of attraction of cohesion among the particles of the mass is least. And the action is aided by the fact that the higher limit of temperature which obtains in the boiler is approximately that at which cast zinc becomes quite easily disintegrated.

I am informed by Lieutenant Cameron M. Winslow, U. S. N., commanding the Cushing, that 250 pounds of zinc are used for a single charge in one boiler, and that when the boilers are first run this charge is so completely destroyed in seven

count of the general arrangement of the several departments:

Machine Shop.

The main machine room is 400 feet long by 216 wide, in five divisions. On one side is the lathe room, which is 50 feet wide, and fitted up with overhead traveling cranes. Here all lathe work is performed. This wing of the main building is two stories in height, and the upper story is occupied by the light lathes, gear cutters, milling machines and screw machines which do not require to be on foundations.

The next section is the main erecting shop. It is 50 feet wide and 32 feet high under the trusses. It is fitted with pits and foundations suitable for the erection of heavy machinery. Two overhead power traveling cranes, each of 25 tons capacity, span this section, thus equipping it for the handling of the heaviest work. It is also traversed its entire length by a rail-

has also an overhead power traveling crane of 20 tons capacity, which is required to serve the large tools with which this room is furnished. Here are located the heavy planers, boring mills and horizontal boring and milling machines, radial drills, &c., which are arranged to machine heavy castings to the best advantage.

The last section is the planer room proper, 40 feet wide, which is filled with planers, shapers and slotters, all conveniently arranged, and is well supplied with small overhead traveling cranes. All these sections are crossed by railroad tracks leading from the foundry and other shops.

In addition to this well-arranged system of shops there are also two others; one 340 feet long by 45 feet wide, the other 200 feet long by 48 feet wide, both thoroughly equipped with tools and tool rooms adapted to the fitting and erection of the smaller machinery. Both are supplied with overhead traveling cranes of

from 3 to 6 tons capacity, and are connected with the main system by railroad tracks.

The front building is 375 feet long by 44 feet wide and two stories high. The first floor is devoted to the offices and store rooms. The second story contains a large and elegantly fitted drawing room, 56 x 44 feet, lighted from the roof, with vault and store room for drawings, blue printing and dark rooms, all connected, private offices, and a room 296 feet long by 44 feet in width, which is occupied by the pattern shop.

A large fire-proof building on the opposite side of the street, entirely isolated, is used for the storage of patterns. This building is 160 feet long and 72 feet wide, divided into three compartments by fire walls. It is arranged with two galleries and is lighted wholly from the roof. This is one of the most complete and safe pattern storage rooms in the world.

Foundry.

The foundry consists of four sections. Three of these are arranged side by side, with the fourth at right angles to and adjoining. The first section is 300 feet long, and is supplied with two overhead power traveling cranes, each of 20 tons capacity. The adjoining section is 140 feet long and it has also two overhead power traveling cranes of 15 tons capacity each. The third section is 140 feet long and is supplied with jib cranes. This room is used for molding small work mainly. The fourth section, at right angles to the others, is 170 feet long by 60 feet wide and is furnished with four jib cranes of 20 tons capacity, all driven by power. These wings are used for molding floors exclusively. Other rooms adjoining and connected are used for core making, cleaning castings and the cupolas, all connected by railways and furnished with cranes for convenience in handling heavy work.

The blacksmith shop is 120 feet long by 55 feet wide, and is provided with cranes, power hammers, case-hardening furnace, bolt-heading machines, and every appliance to make the equipment complete.

The buildings are thoroughly well lighted, enabling men to work to the best advantage. At night the shops are lighted by an electric light plant with 160 arc lights, and gas. They are heated by steam and hot-blast air apparatus. Altogether, the works occupy about 15 acres, over 8 of which are under roof.

The Wilmot & Hobbs Mfg. Company of Bridgeport, Conn., have just purchased the property of the Bridgeport Rolling Mill Company. The original cost of these works was in the neighborhood of \$100,000, and they have been in operation for a year past, under lease, by the Stanley Works, Alfred N. Stanton having the direct management. The plant is located on the harbor at Cedar Creek, and on a branch of the New York, New Haven and Hudson River Railroad, and within about one block from their already extensive cold-rolled steel works, thus giving the best of water and rail transportation facilities. They have for a long time been contemplating the erection of a hot-rolling mill, as all of the cold-rolled sheet and strip steel which they produce has first to be hot rolled from their special billets into long strips before the cold rolling takes place. In having the hot-rolling mill also under their immediate control or supervision, they get many advantages, and are now able to materially reduce the enormous stock of steel which they have heretofore been compelled to carry in the form of a multitude of widths and thicknesses of the hot-rolled strips. They have now an annual capacity of 15,000 or 20,000 tons of steel of all kinds. They are con-

fident that they will shortly be compelled to operate both mills day and night to fill their orders for hot and cold rolled steel, and thus at the same time reduce the proportionate running expenses to a minimum. This new acquisition, which is already in operation, will probably be known to the trade as the W. & H. Hot Rolling Mill, and will likely be carried on as a department.

The Race Across the Atlantic.

Prof. Henry Dyer contributes to the *Scottish Review* a very interesting article in which he traces the development of steamships and their machinery. The great improvements which have taken place may be roughly indicated by the amount of coal consumed per indicated horse-power per hour. Until about 1830 the boiler pressure seldom exceeded 3 pounds on the square inch above that of the atmosphere. From that date a gradual increase took place, and in 1845 the average was about 10 pounds per square inch. By 1850 it had reached 15 pounds. In 1856 Randolph, Elder & Co. employed pressures of 30 pounds in their compound engines, but it was not till almost ten years later that such pressures became general in the merchant service. On the compound engine becoming common, pressures suddenly rose to 60 pounds, and in some cases to 80 pounds and 100 pounds per square inch, and now for triple-expansion engines the average is over 150 pounds, while for quadruple-expansion engines it is 200 pounds per square inch. With regard to coal consumption, the earliest marine engines must have used very nearly 10 pounds per indicated horse-power per hour. In the well-known side lever engines it was about 7 pounds, while for engines in use before the general introduction of the compound type 4 pounds to $\frac{1}{2}$ pounds was the average. Randolph, Elder & Co., with their compound engines, had an average of from $2\frac{1}{2}$ to 3 pounds. In 1872, when the compound engine had been in use for some years, the average was found to be 2.11 pounds, being a saving of nearly 50 per cent. over the ordinary engines, while in 1881 there was a reduction to 1.828 pounds, or a further saving of 13.37 per cent. With triple and quadruple expansion engines there has been a still further reduction of about 25 per cent., the consumption in some of those engines being as low as 1 $\frac{1}{2}$ or 1 $\frac{1}{4}$ pounds per indicated horse-power per hour.

Professor Dyer traces the development of the size of steamships from the Great Western up to the present date. He gives figures to show the best runs during that period, and these are brought down to the recent ones of the Teutonic and Majestic. The latest development of the Atlantic race shows a close approximation between the best steamers of the White Star, the Inman, and the Cunard lines, there being only a difference of a few hours in favor of the order in which their names are given, the fastest passages of each varying from 5 days 16 hours 31 minutes to 6 days 2 hours 31 minutes. The Cunard Line is thus temporarily a little behind in the race, but a company which has shown such spirit in the past is not likely to give up the contest. Two new steamers, each 600 feet in length, have been ordered, and it is stated that their guaranteed speed is to be 22 knots on the measured mile and 21 knots at sea. This latter speed will enable the passage across the Atlantic to be accomplished in about 5 days 10 hours.

Franklin Van Winkle, consulting engineer and mill architect, who has recently removed to 126 Liberty street, issues a very neatly printed pocket table of discounts.

The Baldwin Locomotive Company.

Business does not stand still in this great establishment of Burnham, Williams & Co., Philadelphia. The works are reported as unusually active, over 400 hands being at present on the pay roll, and all departments in full operation, completing some considerable contracts for locomotives. Further important work is in prospect in the near future, and the outlook is decidedly satisfactory.

The one hundred and sixty fourth compound locomotive built on their works since 1890 is now in hand, and the total will have risen to 178 by the end of the month, 14 having yet to be constructed to fulfill existing contracts.

An order for 40 locomotives for the Baltimore and Ohio Railroad Company was received the latter end of February, and of these 12 have already been delivered, while the remainder are being rapidly pushed forward, and it is expected that the whole contract will be completed by the end of this month. These are heavy 20-inch cylinder, simple engines weighing 122,380 pounds when ready for service with water in the boiler. Boilers tested to 220 pounds pressure.

Two additional engines for the Jaffa and Jerusalem Railroad were completed last week and have been shipped from New York to their destination. They are eight wheel, narrow-gauge locomotives of the "Mogul" type, similar to the three furnished to that railroad two years ago.

Twenty compound locomotives on the four cylinder or Vanclain system are being constructed for the Chicago Elevated Railroad, and the first installment of the order will be forwarded to the West this week; the whole number being made up by April 1. These engines are probably the most effective types of their class for power and speed, combined with lightness and durability. They weigh 36,000 pounds.

A double-ender logging engine, built to order, for the Alexander Boom and Lumber Company, was dispatched to West Virginia last week, and at the same time a very perfect little locomotive weighing but 6000 pounds was shipped for Cuba, for service on a sugar plantation.

For the Cleveland, Akron and Columbia Railroad Company an 18 inch cylinder passenger engine is building, and for the Sinnemahoning Valley Railroad Company a compound locomotive which is remarkable as being the only one of its kind hitherto constructed. The conditions of contract requiring an engine of 66 tons, and the maximum allowance being a weight of 33 tons within a wheel base of 20 feet; to get an engine of double weight the wheel base would have to exceed that dimension, but after three months' work, Burnham, Williams & Co. have produced a locomotive on double trucks of an entirely new design, fulfilling the required conditions and possessing the requisite flexibility for rounding sharp curves, each of the trucks being free to swivel. We hope to be able to present a drawing of this novel engine when it is completed.

A story is going the rounds to illustrate the spirit in which some of the Southern iron enterprises have been conceived and are being run. A Northern iron man was offered a Virginia rolling mill, recently completed at a cost of \$200,000, first at 50, then at 20, and finally at 10 cents on the dollar, if he would run it. A refusal finally brought this proposition: That if he would guarantee to run the mill for five years the whole property would be turned over to him as a gift. The owners of the mill were town-lot boomers, who believed that they could not afford to let the mill be idle even if they had to give it away to keep it running. The gift was not accepted.

The Niles Slotting Machine.

The cutting bar of this machine has an extreme length of 10 feet and a stroke of 54 inches. The machine will take in work up to 10 feet in diameter. The diameter of the circular table is 66 inches, the longitudinal traverse of the table 60 inches and the transverse traverse 30 inches. The guide for the cutter bar lowers to within 18 inches of the table and raises to 56 inches above the table. The driving pulleys are 42 inches diameter for 4-inch belt. The machine is of great strength and power. The cutter bar is driven by rack and pinion, adapting it for heavy cutting. The machine has sufficient power to take a 3-inch cut with a $\frac{1}{16}$ -inch feed. The cutter bar is counterweighted and has a quick return. The rated stroke of the machine is 54 inches, but on outside work, which can be placed in front of the cutter bar, a cut nearly 9 feet in length can be taken. The feeds are self-acting in all directions and are readily adjusted. The feed is operated at the upper end of the stroke—never during the cut. The tables have compound movement.

They are moved by power in any direction, and consequently they may be handled as easily as the tables of the smallest machines.

The cutter bar has a very long bearing, which is adjustable vertically. This bearing is raised or lowered to suit the work being operated upon. By this means the cutter bar is always supported close to the work, which makes it very stiff and free from any tendency to spring. The cutter bar is provided with improved relief motion. All the gearing is accurately cut from the solid.

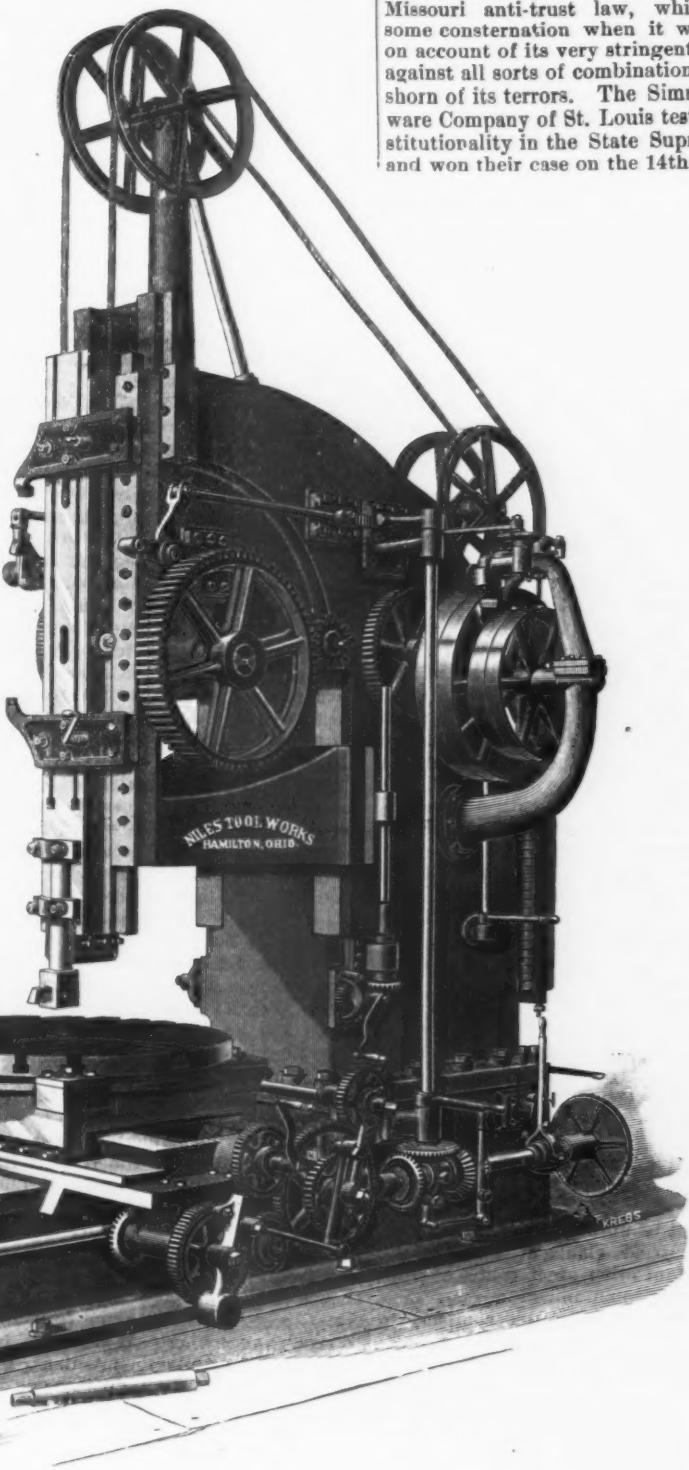
This machine is made by the Niles Tool Works of Hamilton, Ohio.

The officials of the New York Central and Hudson River Railroad Company have announced that their company will begin

to equip them for the building of locomotives. Over 700 men will be employed at first, although the works will eventually provide for over 1200. The buildings will consist of two erecting shops, A and B, 70 x 60 feet each, with a capacity of 50 engines, 25 each. A blacksmith shop, 80 x

ling the largest locomotive will have a travel of 700 feet. In consequence of the new plant the old shops at Syracuse will be discontinued. The settlement which will naturally spring up around the new works will be known as Depew.

The Missouri Anti-Trust Law.—The Missouri anti-trust law, which created some consternation when it was enacted, on account of its very stringent provisions against all sorts of combinations, has been shorn of its terrors. The Simmons Hardware Company of St. Louis tested its constitutionality in the State Supreme Court and won their case on the 14th inst. The



THE NILES SLOTTING MACHINE.

the erection of new car shops at once. The location chosen is a few miles east of Buffalo and consists of 100 acres of land adjoining the tracks of the main line. The shops will cost about \$600,000 to begin with, and are expected to be finished and ready for occupancy by July 15 next. They will first be used for the repair of locomotives, but will be built with a view to the construction of new locomotives and eventually will be used for the latter purpose as well as for repairs. It is expected to expend \$1,500,000 to \$2,000,000 on the plant

252 feet, machine shop, 80 x 360, boiler room, 36 x 80, pattern shop and store-room, 50 x 144, casting storage shed, 50 x 150, offices and storehouse, 50 x 144, boiler shop, 90 x 360, boiler iron shed and blacksmith shed, 20 x 360, transfer table, 80 x 527. The plans for the buildings are all ready and bids are now being taken. The new shops will be as complete in every detail as it is possible to make them. Each of the erecting shops will be furnished with electric traveling cranes of 60 tons capacity, while one crane capable of hand-

court decided it to be unconstitutional, as section 3 provides a penalty for belonging to a trust, and section 6 compels testimony as to whether or not a company, corporation or individual is a member of the trust, and no man, according to the Constitution of the United States, can be compelled to testify to anything that will criminate himself.

Nova Scotia coal hereafter, according to official announcement, must bear a royalty of 10 cents a ton, instead of $7\frac{1}{2}$ cents.

The Submarine Cables of the World.

In looking over a cable chart showing all the submerged wires lying in every sea and connecting every land, it is observed that the longest unbroken lines of cables are those crossing the North Atlantic Ocean between North America and Europe. The shortest over water distance between the two continents is 1650 miles, but the shortest under water distance followed by the cables at the bottom of the sea is nearly 1900 miles.

There are ten submarine cables lying along the floor of the North Atlantic Ocean between America and Europe, and these ten lines of wires are the property of five corporations. Three of the lines lie between Valentia, Ireland, the westernmost part of Europe, and Heart's Content, Trinity Bay, Newfoundland, the easternmost part of America, a distance as run by the cables of 1880 miles, and are the property of the Anglo-American Telegraph Company. This organization was founded on the old Atlantic Telegraph Company, of which Cyrus W. Field was the promoter and which was the company that laid the first Transatlantic cable in the Great Eastern, between the above termini. A fourth cable belonging to the above company runs between Brest, France, and St. Pierre, Miquelon, a cable distance of 2680 miles.

A second corporation covering the same ground is the Direct United States Cable Company. This company controls a single cable between Ballinskelligs Bay, Ireland, and Halifax, Nova Scotia. Length of line 2560 miles.

Another Transatlantic association is the Compagnie Française du Télégraphe de Paris à New York. It operates a single line 2242 miles long between Brest and St. Pierre Miquelon. The other cable following this route is the property of the Anglo-American Company.

The fourth company holding cables in this part of the sea is the Western Union Telegraph Company. Its two cables stretch between Penzance, England, and Canso, Nova Scotia, a length of wire of 2530 miles each.

The last company to lay wires in this North Atlantic region was the Commercial Cable Company—often called the Bennett-Mackay Cable Line. It possesses two lines connecting Waterville, Ireland, with Canso, Nova Scotia, a cable distance of 2360 miles.

Is all the above cables were spliced together a total length of 22,958 miles would be the result.

It may not be uninteresting at this time to take a hurried glance at some of the more important other great routes of submarine electric communication.

The best known telegraph company to Americans is the Western Union. It is essentially an American institution and its land wires are run on poles in every nook and corner of the United States. When it leaves its aerial station some of its wires—as seen above—run to England. There is also a double line from Key West to Havana, which places the Western Union in connection with the wires of other companies leading to all the West Indies and Windward Islands, the East Coast of South America, the Isthmus of Panama and the West Coast of America.

Another American organization is the Mexican Central and South American Telegraph Company, with headquarters at New York. The cables of this company leave Galveston, Texas, for Vera Cruz, making a stop on the way at Tampico. At Vera Cruz a land wire crosses Mexico to Salina Cruz on the west coast of Mexico and joins a cable that makes three ports before touching Panama. From Panama the line runs to the southward to Callao, Peru, making four ports of call *en route*.

Last year this South American Telegraph Company further prolonged its cables from Callao to Iquique, the great niter depot of Chili, and thence direct to Valparaiso. All told, this association has sunk some 5500 miles of cable.

The two Chili ports above are also touched at by the cables of the West Coast of America Telegraph Company. This corporation, whose headquarters are in London, operates 1700 miles of cables between the termini Callao on the north and Valparaiso on the south, making intermediate stops at the principal ports of Chili. North, the cable connects with the Central and South American Company, and so to the United States and Europe; and at Valparaiso it connects with the land wires running across the Andes and the Pampas of Argentine to Buenos Ayres where the River Plate Telegraph Company's short cable of 32 miles connects with the Western and Brazilian Telegraph Company. This company, with headquarters in London, runs its cables through a dozen Brazilian ports, as far north as Para, where it meets the French company's wires that go to the West Indies and Cuba and then by Western Union into the United States and thence to Europe. The length of the cables of the Western and Brazilian Company is 3760 miles.

At Pernambuco, Brazil, the above company is put in connection with the Brazilian Submarine Telegraph Company. The cables of the latter company are doubled over the entire route, and thus the length of the submerged wires is 7326 miles. The lines run from Pernambuco to St. Vincent, Cape Verde Islands, a distance of 1850 miles; thence to Madeira, and thence to Lisbon, whence all Europe and the rest of the world can be brought into connection.

This Transatlantic system of the Brazilian Company might under certain contingencies prove of inestimable value, for should the ten cables of the North Atlantic be all damaged at the same time there would remain but the Brazilian lines to communicate with the other continent.

Reference has been made above to the French Société Française des Télégraphes Sous Marins. Its headquarters are at Paris. From Vezen on the coast of Brazil (connected by land wire with Para) the French cable extends to Santiago de Cuba, making stops at Guiana, Martinique and Hayti. From Cuba the route is to Key West, the States and so to Europe.

Before leaving American waters mention must be made of the West India and Panama Telegraph Company of London, operating 4119 miles of cables among all the islands of the West Indies and the adjacent mainland. This company runs a line from Cuba to Jamaica, to Colon, thence to Panama and the West Coast of America. Another line runs from Jamaica to each and every Windward Island, reaching the mainland at Guiana, whence the French line is brought into the circuit and so Brazil and the Brazil Submarine Company.

Two new lines are projected in American waters, the one from Nassau to the Florida coast, the other from Honolulu to California. The former will be laid within a few months, the latter not for some time.

There are other lines in operation that are not mentioned, notably that from Halifax to Bermuda. While important, they do not form properly a part of the great systems of the world.

The largest and doubtless the most important cable service in the world is that under the supervision of the Eastern Telegraph Company of London. The length of its cables is approximately 25,000 miles. Beginning at Falmouth, England, cables are laid to Spain, Portugal and Gibraltar, thence to nearly all the Mediterranean ports in Europe and Africa. From Gib-

raltar also a direct wire is sunk to Malta and thence to Alexandria, Egypt. Next the wires of this company take the water at Suez and run the length of the Red Sea to Aden, and thence they make Bombay and so bring into the circuit, by land wires, the whole of India. At Aden the Eastern Company makes connection with an East African system running to the cape and thence up the west coast back to Gibraltar.

The Eastern Extension Company, practically the same organization as the Eastern company, begins an extensive submarine cable system at Madras, to which place the land lines bring the Eastern's business. From Madras the lines are laid to the Malay Peninsula and Singapore, that thriving half-way house between Europe and the East. From Singapore one branch line goes up the sea to Hong Kong, China, and Japan. Another branch goes to Java and then to Australia, where it joins the land lines to the Southern and Eastern coasts, meeting the cables to Tasmania and New Zealand. The whole number of miles of cables under the direction of the Eastern Extension Company exceeds 15,000 miles.

There are several other private submarine telegraph companies besides those mentioned above. Altogether there are 25 such associations, having under their control 247 different cables, of a grand total length of about 110,000 miles.

In addition to the cables owned by private corporations, there are 26 separate governments having under their control 800 cables of a total mileage of more than 12,500 miles. It has been estimated that if all the submarine cables, long and short, laid throughout the waters of the globe were added together a grand total length of nearly 300,000 miles would be the result.

Galvanizing in the Cold.—The London Metallurgical Company are introducing a new process of galvanizing which appears to be one in which zinc is deposited from its solution in the cold on the wire or sheets. The inventors claim that in this way a more even and uniform thin coating of the protective metal is obtainable, while at the same time, in the case of wire, the tensile strength is not diminished, as occurs when thin iron or steel wires are galvanized by the common methods of steeping in molten zinc. At the ordinary temperature, too, there is no appreciable tendency to form a zinc iron alloy, which causes a considerable waste of zinc in addition to the reduction of strength already pointed out, and may be regarded as a further defect in the present system. Comparative tests on the hardness of the coating on sheet iron by means of the sclerometer also show that a plate galvanized by this process has a harder surface than that obtained by the ordinary hot method of galvanizing.

A Simple Blue-Printing Frame.—From one of the second-story windows on the south side of the Pratt & Whitney works, in Hartford, is an extremely convenient arrangement for blue printing. It consists essentially of the usual track projecting horizontally from the window sill, and upon this track runs a car formed like a turn table, and which is prevented from running off the outer end of the track by the upturned ends of the rails. This car carries the blue-print frame, which, placed in position on the car, may be moved to the outer end of the track and then tilted at any desired angle in order to bring the blue prints under the direct rays of the sun, no matter what time of day it may be. This practically mounts the frame on a universal joint, permits utilizing the full power of the sun and has been found to expedite the printing greatly.

Polishing Metals.

BY A. D. PENTZ.

It is thought that other mechanics will find as much interest in this list of the methods by which solid metals are worked as I have, which is considerable. There are more general ways to shape, reduce and finish metals than it was supposed there were, and there is no certainty that all are here stated. The idea has been to classify and define, for the use of this article only, and it is not thought that the terms and arrangement here used will commend themselves to others; at the same time a list of methods should, and perhaps will, direct attention to the necessity for a mechanical dictionary, which defines mechanical terms and includes those in use. I find the methods in use at present to shape, machine and

parallel sides of a piece of highly-polished plate glass with that on its fracture.

Polish on a sheet of glass or other crystal, on a piece of hard steel or spiegel-eisen, is not different in the process of getting it from the polish on a piece of soft iron or brass, but the result is different. In the case of polish on the hard material the whole surface is cut or abraded down to a perfectly uniform face, with neither the slightest scratch below nor the minutest elevation above its absolute regularity. If the hard material thus polished be of a perfectly dense and uniform nature the surface thus made will be bright, and no matter what its color may be it will reflect all the rays of light that do not pass through it.

A hand lap for polishing flat faces on hard steel, &c., should be scored as shown in Fig. 1. The squares left on the surface should be as small as convenient for the class of work to be done on the lap. The

with rouge and oil under pressure and at a high speed until it can be made no brighter, a comparison of the two results will indicate that the burnishing effect of pressure and speed is necessarily to polish soft metals to their best.

Professional polishers call the burnishing effect on a surface, "color." It is impossible to get it without considerable heat being developed on the surface of the piece being finished. It cannot be produced by a rigid wheel or by an abrading surface. A hard cloth "rag" wheel produces it quickly with rouge, speed and pressure. The rouge is used to slightly abrade and may be dispensed with to advantage for color at the finish, which should be performed on a clean, hard cloth wheel. The rotative speeds of turning lathes are too slow to produce a fine color on steel, and, again, it is cheaper to do the last operation on a rag wheel.

For flat surfaces an ordinary wooden wheel covered thickly with leather and coated with very fine emery and strong glue to bind it makes the best burnisher. This wheel is usually worn down to a surface by carefully using it a short time to "rough" with. Then it is rubbed, when at full speed, with a piece of flint until every evidence of cut is taken off and the surface of the wheel is practically a smooth, cylindrical corundum burnisher with an elastic backing. This wheel will give the best kind of color to flat pieces, and it only needs a little grease occasionally to prevent scratching.

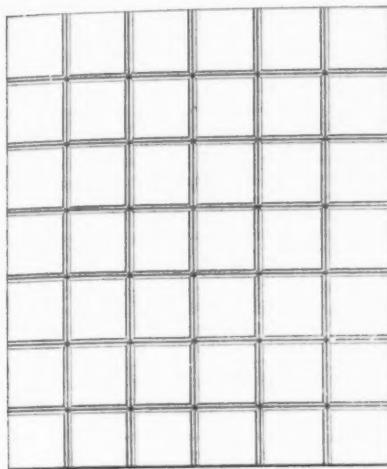
A great difference of opinion exists as to the best speed for burnishing wheels. It may be that about 10,000 feet of surface per minute is as good as any. Cloth wheels, because the pressure is less, should run faster.

It seems in burnishing soft metal that the surface is plastic, or made so to a limited degree by pressure, or heat, and rubbed to a bright surface either by a smooth hard tool in an elastic holder, like the hand, vigorously applied, or by an elastic tool applied so rapidly and vigorously as to develop heat. The flow of metal on the surface seems the same in both kinds of operations. Even if a piece of hard steel be vigorously polished on a coloring wheel it will take on the peculiar burnished appearance, which is quite different from the looking glass surface given by the lap which gives no color. In this case of the hard piece of steel, even if it be as hard as fire and water can make it, it will be found that there will be a bur or wire edge turned over at the corner where the wheel passed off, showing that there had been a flow on the surface of the hard metal sufficient to remove mechanically a part of its body. While it may not be easy to determine whether the wire edge be hard or soft, the polished surface is always found to be as hard as it had been before.

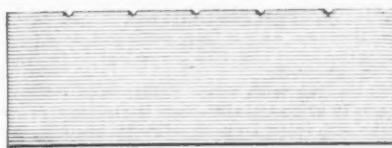
In experimenting on polishing wheels at various times I have produced two which are of some practical value. The idea in both is the same, which is to arrange a flat or cylindrical surface from layers of thin cloth set on edge and prepared by being covered with emery cemented to one side.

In Fig. 2 is shown a wheel designed to be used on its side for lapping or flat polishing. In use it should be mounted on a vertical shaft, so that the working surface A may be horizontal. When so used it will be well to snugly incase it within an annular recess, having a depth equal to about half the thickness of the wheel, to preserve the structure.

This wheel is constructed from a long strip of muslin, to one side of which is glued a coat of fine emery, No. 90 perhaps. When this coat of glue is thoroughly dry place the core B upon an arbor that fits it. This core B should be no longer than the strip of emery cloth is wide; on the contrary, it should be a trifle shorter. On



Face.



Section.

Fig. 1.—Hand Lap.

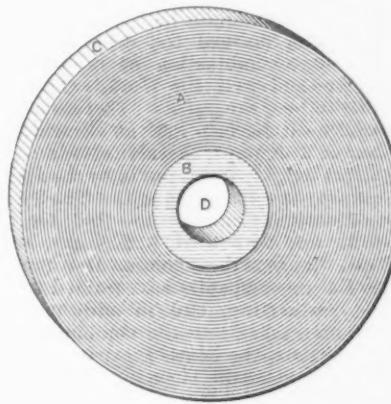


Fig. 2.—Polishing Wheel.

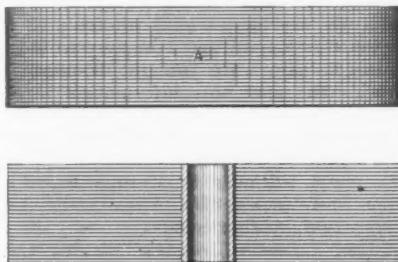


Fig. 3.—Another Form of Polishing Wheel.

POLISHING METALS.

polish the solid metals to be: forging, cutting and abrading, punching and blanking, cold rolling, drawing, cold pressure, cold hammering and swaging and burnishing.

Burnishing is the rubbing and smoothing of the surface of metals to a uniform texture and brightness. A very extensive category of operations produce burnishing. It practically is allied to swaging and to grinding and its definition would properly cover all true polishing operations except abrading.

A mechanic who tries strictly to define polished or burnished in contradistinction to smoothed or brightened will get no help from dictionaries, and will be obliged to fall back on what his experience has taught him. Tin plate, varnish and window glass are bright and smooth, but they are not polished. Velvet is smooth, so is a natural surface on wax, but neither of them is polished or even bright.

All polished surfaces are as smooth and bright as the material can be made. The difference between a brightly polished surface and an equally bright crystalline fracture in the same piece of material is well shown by comparing the surfaces on the

grooves planed in should be very shallow, narrow, and the sides should be very flatly beveled, so that the emery will roll up out of these grooves and attack the whole surface in operation at once. On ordinary laps all the emery must come in from the edges of the piece being lapped; this makes the operation slow and produces a convex surface.

The scored surface of this lap, by feeding the abradent simultaneously to every part of the work, cuts quickly and flat. I made this in 1881 and believe it had not been in use before that time. Its advantages will be seen by those interested. It has been reproduced where known with beneficial results.

In the case of the soft metals and other materials, a limited degree of polish can be got by simply producing a uniform surface. For instance, if a bar of very soft modern machinery steel be finished in a stiff engine lathe, by a very sharp and stiff square-nosed tool, which tool and bar are kept wet by a solution of sal soda in water, a polish will be got which is merely the texture of the metal smoothly laid bare, but left undisturbed. Then, if part of the bar be left as the tool has finished it, and a part of it be polished in a clamp

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each end of the arbor and pressed tightly against the core B two flanges should be placed as large in diameter as the proposed wheel is to be. These flanges should be planes on their opposing faces, which should be parallel to each other and run true when the arbor is revolved. They also should be well secured to the arbor, and be so stiff that they may not spring away in the winding. This core B may be of wood.

The arbor should be mounted on the centers of a lathe and the end of the emery-coated strip attached to the wooden core by wooden pegs, emery side outward. The uncoated side of the cloth must be covered with glue, not too thinly dissolved, as it is wound on and roll underward so that the emery side of the cloth shall go on the lower side toward the floor to assist in gluing. A strong strain should be kept on the strip. The glue should be evenly and carefully applied. If wound too fast the glue will not have time to saturate the cloth perfectly before it is in place and may stretch after it is covered by another layer.

If a ridge or lump appears it can be reduced by a few pegs. The ends of the strip or strips wherever they occur should be pegged, but the pegs should be kept near the center between the flanges and use them as thin as convenient.

When a wheel is completely wound it should be kept in the flanges until the glue is set. Of course, a wheel made this way will warp in drying to some degree, as all solid wheels do; they all require truing up. This wheel trues with the usual tools, but must not be turned on the periphery.

The wheel shown in Fig. 3 is made of disks of emery cloth glued and clamped together, having no two emery surfaces in contact. This wheel should be laid up one sheet at a time and dried before another is attached. Thus the wheel may be made with but little warp if carefully clamped. The core is of lead. When dry, the lead core is bored to average the wheel and the wheel is trued all over. Only the periphery is to be used to polish on.

These wheels may be run at a tremendous speed with safety. They combine the advantage of a rag wheel with that of a leather coloring wheel and I believe they will be found to have qualities in preparing work for plating that are at present quite desirable.

Quite an Emphatic Denial.

Our readers will be somewhat amused by the following communication, which recently appeared in a Chicago daily paper:

To the Editor.—SIR: Under the heading of "A Vicious Assault by Strikers," in your Friday issue, occurred the following: "William Anderson, foreman of the Aermotor Works, at Rockwell and Twelfth streets, was brutally assaulted at 8 o'clock last night by three strikers while unhitching his horse in the rear of 125 Rockwell street. He was knocked down and so brutally beaten that his life is despaired of," &c. This paragraph is wrong in the following particulars: 1, William Anderson's life is not despaired of; 2, he isn't foreman at the Aermotor Works; 3, none of our 17 foremen bear the name of William Anderson; 4, we do not know that such a man exists; 5, there is no strike at the Aermotor Works; 6, our foundry is full of well-satisfied workmen, and within three weeks we shall double its capacity and make place for double the number of well-satisfied workmen.

The paragraph was furnished to the police by some unknown party, and made out of whole cloth. Detectives were sent out here to look up the criminals, but since there had been no crime the matter was dropped.

L. W. NOYES,
President Aermotor Company.

The English miners determined to resume work on the 21st inst., but only for five days in the week.

WORLD'S FAIR NOTES.

Bidding for Electric Lighting.

The special event of interest in exposition matters last week was the opening of bids for electric lighting, which occurred on the 15th inst. When the bids were opened it was found that there were but two proposals. One was by the Thomson-Houston Electric Company, offering to put in 6000 arc lamps at \$38.50 each; the other by the Western Electric Company, offering to put in 500 lamps at \$31.25 each. In case, however, the bid was accepted the latter company proposed to give an additional 100 lights without further cost. This would really make the bid about \$26 per lamp. The company, however, withdrew their bid at the last moment, leaving the Thomson-Houston people the sole bidders for the work. Exposition officials were more than surprised at the fact that only one bid from all the electrical companies in the country had been received. They soon reached the conclusion that there was a combination of the electrical concerns and that the World's Fair was going to be "squeezed." There is now in operation at Jackson Park an electric-light plant of 200 lamps, the cost of which was \$11 per lamp. It was put in by the Edison Company some months ago. The Thomson-Houston Company also bid for that work, but it wanted \$12.50 per lamp. Since that time the Thomson-Houston and the Edison companies have formed a business partnership, and in addition there have been taken into the combination the Fort Wayne, the Brush Electric, and two smaller concerns. These have apparently boosted the price for the Thomson-Houston Company, for last January B. E. Sunny, the manager of the Thomson-Houston Company at Chicago, wrote a letter to Chief of Construction Burnham, saying that \$20 per lamp would probably be the price the Exposition Company would be asked to pay. He thought it might be less. He gave this information after a conference with representatives of various electrical interests. The World's Fair management has determined to send an electrical engineer to Europe to solicit bids from the electrical firms in the leading manufacturing centers.

The Thomson-Houston Electric Company saw that they had been placed in an unpleasant position before the community, and accordingly dispatched Lieutenant Spencer of Boston to Chicago to endeavor to set matters straight. He appeared before the Committee on Grounds and Buildings on the 18th and made the following explanation, which is very interesting reading:

I beg to submit to you the following statement with reference to the bid of the Thomson-Houston Electric Company for arc lighting for the exposition:

It is unnecessary to state that this is an extraordinary project, calling for the largest central station plant in the world, with three times the number of machines and lamps operated by the Chicago Arc Light and Power Company, calling for the product of our factory in this class of machine for the next eight months to come and for all lamps, at present rated production, that can be turned out in six months, disregarding all present and pledged orders.

In order to meet your requirements for delivery of apparatus on July 1, August 1 and September 1 next it was necessary to call upon our allies.

It is to you a matter of indifference whether their bid be submitted separately or in conjunction with our own. It was our purpose to serve the Columbian Exposition at a fair price and to do what no other corporation in existence can do, to get this enormous amount of apparatus with the engineering skill necessary to superintend its installation, maintenance and operation within the short period of time your specifications permit.

The bids submitted to you are based on the cost of apparatus, allowing for freight and 18 months' interest, insurance, depreciation, repairs and attendance. You want \$500,000

worth of apparatus to use 18 months, from August, 1892, to February, 1894. Figure for yourselves the interest upon this amount at 6 per cent. per annum, but remember that our preferred stock must pay 7 per cent. accumulation. In other words, in order to produce this apparatus, we, ourselves are borrowing money at 7 per cent. per annum. Remember also, that any manufacturing stock worthy of quotation should earn from 8 to 12 per cent. per annum.

I would have no right to tie up \$500,000 worth of the capital stock of my company without securing for that \$500,000 the rate of interest that is paid by the company. Nor would the directors of any concern be authorized in the scheme of such a magnitude with the returns in advertisements, &c., so out of proportion to the expenditure, to tie up this amount of money in apparatus bringing no returns.

You want 120 of our largest arc machines and 1200 boxes of our arc lamps, 25 to 30 carloads of material. Figure for yourself the freight, the cost of boxing, &c., on this consignment.

As I said before, you want 6000 arc lamps, three times the capacity of the Chicago Arc Light and Power Company, to furnish which we must resort to five different concerns, making five different classes of apparatus and requiring for satisfactory handling not one dynamo superintendent, as mentioned in your specifications, but five, and not one lamp man, but five, and all of these not men of ordinary capacity, but first-class engineers and executive officers, commanding good salaries. This we contemplated providing in our offer to you of these arc lights.

Then compute the interest upon this material while in progress of manufacture, while in transit, during the period of its use, during its return to the factory and the continuance of its repair, which amounts to almost entire renewal. You want this apparatus to use for a period of from 17 to 19 months. At the end of this time it will be old, unsightly, greasy and we will be compelled to sell it at half its original value or return it to our factories for overhauling. The machines will have to have new armatures, new shafts, new bearings, new commutators, new air blasts, new fittings throughout in order to fit them as first class of machinery, salable and new. The lamps must be taken apart, piece by piece, cleaned of rust, rebuffed or repainted, the frames rewired, many of the delicate parts entirely renewed, all reassembled, all readjusted, the lamps restested and reinspected by our inspectors before they can be allowed to go to the shipper to fill his orders. We have figured all these items most carefully, and I can say to you that the price is fair, sufficient I hope to insure us from loss, and not so high as to assure us of any profit.

In dealing with other contractors you have scarcely expected that they would provide material and labor free of expense to the exposition. Your buildings have been paid for at fair prices; service of every other character has been paid for at fair prices.

The lighting provided for the exposition will be the means of opening the grounds for evening entertainment. The estimated receipts from these entertainments are, if reports reaching me are correct, enormous.

We propose to give you in this service first-class apparatus, first-class engineers and superintendents to relieve your administration bureau from all annoyance and uneasiness on account of failure of this service at any and all times during the exposition.

The task that we are assuming is something beyond the capacity of any other firm on the face of the earth, and the nerve in submitting an estimate for the entire installation is something that should receive due credit from your committee.

That prices are fair I will endeavor to assure you from the figures taken from other expositions.

In 1881 Paris gave the first exposition that had ever attempted, on any extended scale, night entertainment. In order to light the grounds and buildings there were needed for this purpose 1383 arc lamps of various candle power, actuated by 1350 horse-power of steam. To provide for this entertainment the exposition authorities offered the parties undertaking the lighting 10,000 francs and one-half the gate receipts from evening visitors. The admission fee was 1 franc. The evening receipts in the three months of the exposition proved to be 337,696 francs one half of which, 188,848 francs, plus the 10,000 originally paid, made for the lighting syndicate 198,848 francs. By certain allowances for overtime this was increased by one or two thousand francs, making per lamp for the three months' lighting 144 francs each, or per month per lamp 48 francs, or for eighteen months per lamp 864 francs, or \$172.80 per lamp. It is true that in this case the lighting syndicate also furnished the steam power.

Good central station practice allows for

power 20 per cent. of the cost of the light, for all attendance 30 per cent.

In the case of the Columbian Exposition, the most expensive part of the attendance, to wit: superintendence in and out of the station, becomes a part of the contractor's duty. I have, therefore, assumed that power and attendance should be figured as 40 per cent. of the total value of services rendered. Taking 60 per cent. then of \$172.80 as the price of lighting at this exposition when placed on the same basis as lighting for the World's Columbian Exposition, we find that the price per light would be \$103.68. Compare this, gentlemen, with \$38.67.

The first exposition in this country to attempt night entertainment was the Louisville Exposition of 1883. This was lighted by the Edison Company with 5000 incandescent lights, as again the following year, both cases proving serious losses to the Edison Company. The plant from Louisville in 1884 was transferred to New Orleans, and there installed to light the buildings of the World's Exposition in that city. The estimated losses of the Edison Company amounted to about \$20,000.

Subsequent expositions at Louisville were lighted by the Fort Wayne Jenney system at the price, I am informed, of \$100 per lamp. This price was also charged by the Fort Wayne Company at New Orleans, both expositions lasting for a period of three months only. In all these cases the exposition provided the power.

You may say that this was in a time when electricity was an experiment, that apparatus was more expensive and assistance of technical nature not so easily obtained. True; but it was also at a time when electricity was endeavoring to advertise itself, to bring itself into prominence; when people of hopeful dispositions were willing to sink thousands of dollars in experiments that promised to ultimately advance the use of electricity for lighting.

We have, however, one exposition of later date upon the experience of which this Columbian Exposition is largely basing its projects. This was the Paris Exposition of 1889.

When the matter of lighting for evening entertainment was considered, the task was found to be so enormous that the various lighting companies were compelled to form themselves into a syndicate in order to provide the apparatus called for by the Minister of Commerce and Industry, who had the exposition in charge.

The public lighting by this syndicate required 1000 horse-power for arc lights and 1000 horse-power for incandescent lights. The private lighting required 625 horse-power of arcs and 500 horse-power of incandescent lights. All these lights were confined to an area less than 600 yards square.

Basing their first contract on the experience of the previous exposition, the syndicate was offered a lump sum and a certain proportion of the gate receipts. The exposition, however, being unexpectedly successful in the sale of coupon lottery tickets, arranged with the syndicate a further and second contract, being what was expected to be a fairer basis to the exposition company. The agreement was to pay to the syndicate 1,800,000 francs in equal installments of 300,000 francs monthly.

The actual lamps furnished by the syndicate for public lighting under this contract consisted of 1045 arcs and 8837 incandescents, the equivalent of less than 2000 arc lamps. This, then, was at the rate of 900 francs per lamp for six months' service, \$180 per lamp, or, subtracting again 40 per cent. as the proportional part of expenses borne by the World's Columbian Exposition, it would make the price to ourselves \$108 per lamp. Compare the two cases. We propose to furnish you for three times six month three times the number of lamps for one-third the price of the Paris Exposition syndicate per lamp; in other words, the rate that you obtain is one-ninth of the rate of this syndicate to the Paris Exposition.

It is certainly a matter of congratulation for every American citizen that the United States has made such progress beyond Continental Europe in the application of electricity for industrial purposes that a single firm can undertake three times the amount of work that required a syndicate, sanctioned by the Government of France, to perform less than three years ago, and it is certainly a matter of most serious consideration by yourselves that in spite of a rate of one-ninth as low as that of Paris, we should have been criticised through lack of proper information as determining to take advantage of the World's Columbian Exposition.

We are interested in the exposition to the extent that we do more than most of your contractors have done. We propose to furnish material, apparatus and service at less price than any central station in the world can afford.

Suppose you should call upon the Chicago Arc Light and Power Company for your lights; 600 lights all night at 50 cents per light and

5400 lights until 12 o'clock at 33½ cents per light, a total for power and attendance of \$1900 per night, or subtracting 40 per cent. as the value of power and labor furnished by the exposition, \$1140 per night for the illumination of your grounds. Take this for 450 days and what is your bill for lighting? Five hundred and thirteen thousand dollars, as against an offer by ourselves of equal service for \$222,020.

The Chicago Arc Light and Power Company are furnishing light at less than the average rate, a rate that requires for proper returns to stockholders the most rigid economy, the most careful supervision of all expenditure.

A comparison should be sufficient to convince every one of you that we have endeavored to be fair, that we have made you a bid as low as sound business principle will permit.

I have, therefore, to submit a formal request that the action of Tuesday last in rejecting this bid be reconsidered.

The subject submitted was discussed by the directors present, and action deferred.

Electric Generating Apparatus.

Bids for furnishing the generating apparatus for the electric power plant to be used in Jackson Park were opened on the 18th inst.

The bids opened were in response to specifications sent out last January. The machinery is to be leased and returned to the owners after the fair. Five bids were received. The Eddy Electric Mfg. Company of Connecticut offered to furnish the 300 horse-power generating apparatus for the Transportation Building free of cost. The National Electric Mfg. Company of Eau Claire, Wis., offered to furnish the apparatus for this building for \$2500. The Western Electric Company bid for the same service \$6500.

The Mather Electric Company of Manchester, Conn., bid on the Mines Building and offered to furnish 600 horse-power for \$2450.

Then came the Thomson-Houston Company with a bid for furnishing all the apparatus for \$52,900. Further than this the Thomson-Houston Company wanted the exclusive right of furnishing exhibitors such power as might not be included in the general plant, and charge therefor \$40 per horse power. They also wanted the sole right to furnish all supplies and the right to sell or lease meters for the measurement of the amount of power used. They wanted \$50 a day penalty for every day after March 1, 1894, that their machinery should be retained on the exposition ground. Lieutenant Spencer explained that the reason why his company wanted to have exclusive charge of all the work and the supplying of extra light was to prevent the possibility of having their lines in the subways tampered with by the representatives of other companies who might be discharged employees of his firm. He said he would greatly prefer to have no extra lighting.

Bids for Launches.

Bids for furnishing passenger launches for the lagoons in Jackson Park during the World's Fair, and for the privileges of operating such launches on a percentage, were opened last week. For building and selling the launches bids were received as follows:

The Gas Engine and Power Company, Morris Dock Station, N. Y., offered to furnish 30 to 60 launches, operated by naphtha gas, 30 feet length over all, 6 feet beam, 32 inches draft, at \$1400 each, or the same number, 34 feet length over all, 6 feet 6 inches beam, 32 inches draft, at \$1900 each. Charles P. Willard & Co., Chicago, offered to furnish 30 steam launches 34 feet over all, 6 feet 6 inches beam, for \$1282 each, or 40 steam launches for \$1247.50 each, or 60 steam launches for \$1228 each.

Bids for operating launches during the fair were as follows:

The Electric Launch and Navigation Company of New York offered to furnish from 20 to 60 34-foot launches and give the

Exposition Company 33 per cent. of the gross receipts, with electricity as the motive power. The Columbian Launch Company of Chicago offered to furnish from 30 to 60 launches and give the Exposition Company 27 per cent. of the gross receipts, provided they also furnished, free of charge, one launch for fire purposes and one for police purposes; or offered to give the Exposition Company 31 per cent. of the gross receipts without these and other conditions; the motive power to be electricity, if it could be shown to meet the requirements, otherwise they would furnish launches equipped with steam power. Charles P. Willard & Co. of Chicago offered to furnish 20 or more small passenger steamers, carrying 50 to 60 people each, guaranteed to pass Government inspection, and to furnish with each boat a Government licensed engineer and pilot and to give the Exposition Company 40 per cent. of the gross receipts.

The Mining Department.

The Colorado Board of World's Fair Managers is actively developing the mines and mining section of the exhibit of that State. Realizing the magnitude and richness of her mines and the wealth and variety of her mineral resources, the board has organized a special department of mines and mining and intrusted it with the work of preparing a mining exhibit which will be complete as possible and commensurate with the greatest and most prominent industry of the State. The managers have printed and distributed copies of the general classifications and rules of the department of Mines and Mining of the World's Fair, and have distributed it so thoroughly through Colorado that no mining point has been left without thorough and authentic information of the scope and character of the department.

It is intended that the exhibit of Colorado shall be both technical and economic in its character, showing at once the scientific classification of the mineralogy and lithology of the State, and a correct presentation of its geology, at the same time a popular and massive display of its resources in ores, building stone, coal, iron, commercial clays, oils and all other mineral products of whatever character. Its exhibit will, so far as now developed, be classified within the following divisions: Technical, economic, industrial, mining, metallurgical exhibit, mining, machinery, statistical and historical.

The mineral exhibit from Michigan is sure to attract much attention. This will include, besides extensive collections from museums, &c., granites, marble, and other building material of rare and beautiful qualities, but which have not yet been marketed to any great extent; raw material from the iron mines in plates 69 to 70 per cent. pure as taken from the mines; and especially specimens of copper, which in its pure state is found only in the Michigan mines. A copper exhibit, the "largest and most extensive ever attempted," will be made by the Calumet and Hecla mines. In speaking of it, the company's chemist says that it will include "obelisks of pure copper ranging in weight from 50 to 500 pounds, also quantities of wire and sheet copper that has been drawn and rolled from the native metal just as it was taken from the mines; rods of copper bent into different shapes, and even tied into knots, as one would tie a cravat, without breaking or splintering, as would be the result of such an operation on the copper produced by other mines and containing an alloy, which renders it less ductile. A curious fact concerning the silver deposits some times found in the copper is that nature has welded the silver and copper together without mixing them, whereas no process has ever been discovered by mineralogists by which the same thing can be done

artificially; examples of this phenomena will be included in the exhibit."

Consul Partello, at Dusseldorf, informs the Mining Department that since the Emperor has expressed a particular desire that the iron industry of Germany shall be adequately represented at the exposition, those engaged in the mining and metallurgy of iron throughout the empire have manifested great activity in that direction. From another German source it is learned by the department that Mr. Masseneg, the inventor of an important process for the desulphurization of pig iron by treatment with manganese, will make a full exhibit of the process and the products. This will be an important feature of the division of metallurgy, for the process is

ment, as the exhibit, if allowed, will come under the head of naval and marine display.

MISCELLANEOUS ITEMS.

The reports of General Superintendent Geraldine to Chief of Construction Burnham show great progress upon all the buildings during the last week. The slight falls of snow which prevailed for a couple of days did not interrupt the work and the superintendents on the various buildings have kept a full force of men pushed to the utmost. Even on St. Patrick's Day the hundreds of Irish mechanics and laborers on the grounds did not knock off work, but could be seen on the buildings wearing their badges of green, and busy as

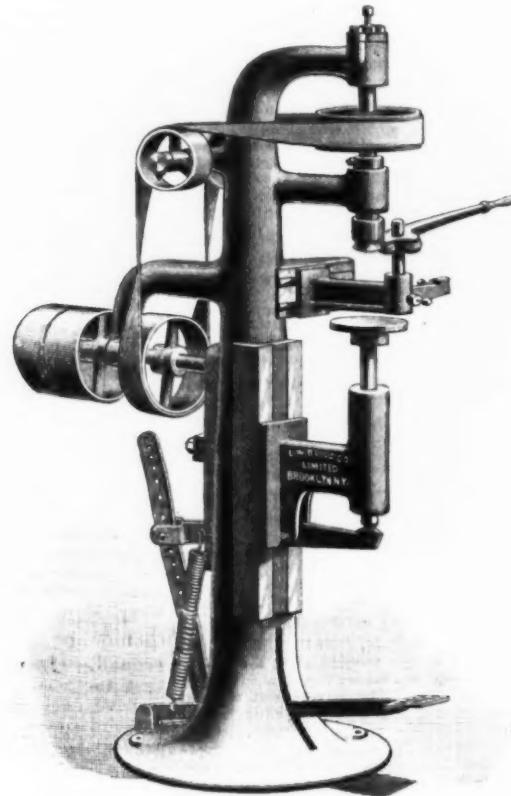
partment at the south end of Jackson Park was awarded to McArthur Bros., for \$1946. The contract for the ornamental iron work on the gallery of fine arts was awarded to the Chicago Architectural Iron Works, for \$14,500.

THE BLISS DOUBLE-SEAMING MACHINES.

Double-seaming machines have become standard tools among manufacturers of pieced tinware, as they operate more rapidly and produce a more perfect seam with unskilled labor than can be produced by other and more expensive methods, and by them ordinary grades of coke tin can be worked successfully. They are used for double seaming the ends of fruit,



No. 1.



No. 2.

THE BLISS DOUBLE-SEAMING MACHINES.

one in which every furnace man in the world is interested. The works are very extensive and are located at Hoerde, in Westphalia.

A BRITISH REQUEST.

The British commission has sent a communication asking for space to exhibit the rifle-caliber guns manufactured by the Maxim-Nordenfeldt Gun Company. The company want to erect a building 30 x 15 feet, to exhibit their guns in practice. One end of the building will be filled with sand bags, into which the projectiles of the guns will be fired. It is claimed that the arrangements are such as will insure perfect safety and will be reproductions of a similar exhibit recently given at the Royal Naval Exposition in London. The rapidity of fire of the Maxim gun-caliber automatic machine is said to average from 600 to 650 rounds a minute.

The request was referred to Chief Willard Smith of the Transportation Depart-

they could be. Material is now being sent along promptly.

The great traveler for the Manufacturers and Liberal Arts Building is now completed with the derrick tower, which is itself 86 feet high. This whole false work is now entirely up, making a total height of structure on the building from the floor line of 218 feet. The iron work for the building is being shipped ahead from the contractors and the pieces are fitted in the shops and there taken apart before being sent on, this precaution saving any delay that might be caused by missing pieces.

The following contracts have been awarded: For hose reels, including valves, nozzles and 500 automatic wheels, to the Birdsall Company of Auburn, N. Y., at \$29,750. The second outfit was awarded to E. B. Preston of Chicago for \$21,000, the salvage in both cases to go to the Exposition Company. The contract for the propagating house in the landscape de-

vegetable, fish, paint and other round cans; pails, buckets, dippers, coffee pots, pans, cone-top oil cans, powder kegs and other round articles of tin and sheet iron ware.

The operation of double seaming by means of these machines, which are made by the E. W. Bliss Company, Limited, of Brooklyn, N. Y., consists in so folding the edges of the heads and bodies of round sheet metal packages together as to present a compact layer of four thicknesses at the joints. The heads are pressed in such shape as to assure for them a central position in relation to the bodies, which are flanged out at the edges preparatory to being subjected to the action of the double-seaming machine.

The body and head are placed between the two round plates shown, the lower plate is then raised by means of the foot treadle, and a forward and backward movement of the hand lever shown completes the double seam. The table in the

No. 2 machine is provided with a rack and pinion movement, not shown in the engraving, which facilitates the adjustment for height of work. These machines are made in four sizes, Nos. 1, 1½, 2 and 3.

The General Principles of Contracts.*

All commercial transactions rest upon contracts. Legally defined, a contract is a mutual agreement, for a valid consideration, to do or not to do a certain thing. There is no legal distinction between a verbal and a written contract as such. That is simply a question of proof. The reduction of a contract to writing evidences the actual agreement of the parties, and cannot be denied by either of them; though when proved by competent evidence, those agreements are of equal force if made verbally. There is another species of contract, expressed neither verbally nor in writing, but which exists solely by implication or force of law. Thus, if a person sells goods or merchandise to be used for a specific purpose, which is known to him, the law imposes upon him an implied guarantee that they are fit for the use for which they are intended, though expressly he makes no such warranty. A man who sells by sample, thereby warrants the bulk to be delivered equal to the sample, though there is no express warranty of that nature.

The essential elements of a contract are parties of contracting power, a valuable consideration, a legal object, and a mutual agreement. While there is much legal interest attached to the question of contracting capacity, that is of small moment here, for it does not enter largely into commercial transactions. The contracts of minors, married women and idiots are subject to special rules of law, which are generally understood. There must be a consideration to sustain a contract, and it must be a valuable one. A valuable consideration is an injury or detriment suffered by one party, conferring some benefit or advantage upon the other. Without this there can be no legal consideration. In law this may be a benefit to one party or injury to the other directly, it may be forbearance to insist upon accrued rights, the assignment of a valuable right, mutual promise, or consideration coming from third persons. As a rule the law is satisfied if the consideration is valuable, and its adequacy is generally a matter with which the law will not concern itself. However, when the rights of persons not parties to the contract intervene, that may become a question of importance. A consideration which would sustain a contract as between the parties will often be regarded insufficient when it appears likely that the contract is made to defraud the rights of others. There must be a mutuality of agreement. If the parties do not all agree to the same thing there is nothing which a court can enforce, for courts cannot construe agreements into contracts. However, if a contract is not clear as to its meaning, the court will so construe it as to effectuate the intent of the parties, if that intent can be ascertained. The rule of construction is to give that meaning to an ambiguous contract which will tend to aid the object sought rather than defeat it, for the presumption is that the parties intended a valid and not invalid contract.

In many trades and localities there are general customs and usages, universally followed. Parties who are engaged in a trade or at a locality are presumed to contract with reference to such usage or custom. But, in order to constitute such usage or custom a part of a contract, it

must be so universal as to be known to all, or so general that it should be known. Those persons who enter into contracts which they affect are presumed to make their contract with reference to them.

Where verbal negotiations culminate in a written contract, the formality attendant upon executing the writing gives rise to the legal presumption that all the prior propositions and agreements are merged into the writing, and therefore no prior verbal agreement can be urged to vary the written contract. It is perfectly competent for the parties to make verbal agreements subsequent to the written contract varying its terms and changing its provisions.

In making contracts, with these few general principles in mind, much legal complication could be avoided if business men would be concise and explicit in stating exactly what their agreements with each other are, in language which can be subjected to but one construction, and which is susceptible of but one meaning.

Steel Production in Great Britain.

According to a preliminary return just issued by J. Stephen Jeans, as secretary of the British Iron Trade Association, there has been a very decided falling off in the production not only of raw material, but also of finished iron and steel. The production of Bessemer steel ingots is 18.5 per cent. less than in the previous year, the total having been 1,642,005 tons. On 1890 the decrease is still more marked. South Wales, the largest producing district, seems to have fared badly, the decrease there having been 24 per cent.; in Cumberland, 26.6 per cent.; Sheffield, 17.8 per cent.; Cleveland, 16.7 per cent.; Lancashire, Cheshire, Staffordshire and Scotland, about 4 per cent. The decrease in acid steel is equal to 19 per cent., in basic steel 16.5 per cent. South Wales, which "pins its faith" by the acid process, turned out 449,481 tons. Cleveland made 4 tons by the basic process for every 3 tons by the acid process, and is the largest producer by the former method. The total make of the district is 356,209 tons. Sheffield, which turns out 241,388 tons in all, only made 43,865 tons by the basic process, and the other districts contributing to the make of basic, including Staffordshire and Scotland, brought the total to 335,776 tons, which is only a fifth of the total output of Bessemer steel. Last year the proportion was about the same. There are 83 acid and 25 basic converters, but only two-thirds were in use, and the production per acid converter in use was about 23,560 tons per annum, rather less than in the previous year, but more than was got from each basic converter, but Cleveland gets nearly 34,000 tons from each of its basic converters. From each acid converter South Wales gets over 23,000 tons. Cleveland 30,000 tons, Sheffield 14,000 tons, Cumberland 43,000 tons, Lancashire and Cheshire 24,299 tons.

Engineering notes that of the steel ingots produced 40 per cent. were made into rails, whereas last year over 50 per cent. were thus used, so that there is even a larger decrease in steel rails, proportionately speaking, than in ingots, for in 1891 there were only 662,676 tons of rails rolled, against 1,019,606 tons in the previous year, a decrease equal to 35 per cent. The decrease is greatest in Cumberland, where the output is less than half; in Wales the total is 41 per cent. less, and in Cleveland it is three-fourths what it was in the preceding year. If 10 per cent. less of the steel made was used for rails, clearly there must have been an increase under other heads, and among these may be noted merchant bars, of which 210,710 tons were made, more than half in South

Wales, the increase being nearly 16 per cent., while the make of tires has increased by 90 per cent. to 49,298 tons. The result of the lesser quantity of billets and blooms taken by America is a decrease of 31 per cent., to 213,443 tons. For a like reason the make of tin bars has decreased to one-fourth the make of the previous year, being now 18,326 tons. Of other manufactures plates stand about the same as a year ago, 66,605 tons having been produced; so also with castings, which stand at 6738 tons, a result of the shipbuilding and engineering works having been steadily employed. Of sleepers considerable less than half have been made, 18,825 tons, and a like result is brought out in the case of fish plates. In these figures Scotland is not included, but the results are proportionately correct for the whole kingdom.

Glancing now at the figures for open-hearth steel, in which Scotland and the northeast coast excel, we note a decrease of only 3 per cent., the total production having been 1,514,538 tons. This is still above the total of 1889 by 6 per cent. Scotland, which turned out a third of this, has a decrease of but 1.3 per cent., while Cleveland, which has credit for another third, has a decrease of 6½ per cent. Wales, with an output of 255,719 tons, has a decrease of 10 per cent., and Lancashire of about 4 per cent., while Sheffield and Leeds have increased their make by about 7 per cent., and Staffordshire by 12.3 per cent. The proportion of basic to acid is about the same as in the previous year—1 to 14 tons. Wales and Staffordshire continue chief producers by the basic open-hearth process, but in Lancashire and Cumberland they last year found successful competitors; Scotland and Cleveland have produced lesser quantity. The production per furnace in the case of the acid process is considerably greater this year than in the previous year, but less in the case of basic steel.

The production of pig iron last year was 7,228,496 tons, against 7,875,190 tons in 1890. This shows a decrease for 1891 of 646,634, or over 8 per cent. In 1890 the decline, compared with the preceding year, was not quite 4½ per cent. The output of the second half year of 1891 was 200,000 tons less than in the first six months of the year, thus showing the gradual falling off in the iron trade. Of the total production of pig iron in 1891, 3,777,544 tons are returned as forge and foundry pig, against 3,942,308 tons in 1890; 3,301,733 tons as Bessemer pig, against 3,737,792 tons; and 149,219 tons as spiegeleisen and ferromanganese, against 195,038 tons. There was a satisfactory decline in stocks of pig iron. Stocks in makers' yard and warrant stores on December 31, 1891, were 1,292,277 tons, against 1,393,041 tons at the corresponding date in 1890, the decline being thus 100,764 tons, or over 7 per cent.

Howe, Brown & Co. of Pittsburgh are making a special tool steel from American stock exclusively, which shows exceptional purity. An analysis of a razor steel gave the following: Carbon, 1.30; manganese, 0.28; phosphorus, 0.006; silicon, 1.70, and sulphur, 0.008 per cent. This is lower in phosphorus and sulphur than the famous English special steels. They are affording their friends an opportunity to test the quality of the metal by placing at their disposal Torrey razors made of this steel.

H. R. Austin of Norwood, N. Y., has invented a turbine water wheel having eight issues with 16 buckets, the wheel being so constructed that the side as well as the down pressure of the water is obtained, making a double turbine wheel, and also obtaining a greater per cent. of the water used than heretofore. He is also the inventor of the well-known Aus-

THE WEEK.

A cable dispatch from London, March 16, reports that the Court of Chancery has appointed a receiver for the banking firm of Murietta & Co., Limited, whose troubles have been before the public for a long time. The outstanding liabilities are stated to be £4,400,000.

It is reported that the Postal Telegraph Company design to erect a building at the northwest corner of Broadway and Murray street, 70 feet 5 inches on Broadway and 155 feet on Murray street, 12 stories high, and at a cost of \$700,000. The material is to be of brick, stone and iron.

The statement comes from London, on the 18th inst., that the Palmers, one of the largest naval and shipbuilding firms in the United Kingdom, are arranging to transfer the plant of their works at Newcastle-on-Tyne to some port in the United States, where they will conduct their business in future. Mr. Rockefeller of Standard Oil fame is reported to be interested. The expectation is to have a share in the construction of war vessels.

The Bimetallic League is reported from London, 18th inst., to have determined to start the question in Parliament of an international conference. They are encouraged to do so by the interest which Commoners have shown, among them Sir M. W. Ridley.

It is reported that the New York Central Railroad Company are about to erect a ten-story building on Forty-second street, for offices.

North America alone will soon have 100,000,000 of English-speaking people, while there are 40,000,000 in Great Britain and Ireland. In South Africa and India also the language is vastly extending.

A conference of the Democratic members of the Ways and Means Committee on the 15th inst. determined not to press for a vote on the bill relating to wool until after disposition shall have been made of the Bland Silver bill.

A distillery of spirits from dates, under the Russian process, is about to open at 56 Monroe street, which was formerly a Lutheran church. It is to be operated under the name of the Eagle Distillery, and to produce 250 gallons daily.

The English Durham miners are in great excitement over the action of the Miners' Federation, which is thought to have deserted them. They are on a strike against a 10 per cent. reduction of wages. They number 90,000.

The Municipal Consolidation Inquiry Commission are not disheartened at the failure of an appropriation. They seem disposed to continue the movement for the establishment of the City of Manhattan.

Diana, of the Madison Square Garden, has been called down and a younger, or at least a more petite form, is to take her place.

Siemens & Halske, the great electrical manufacturers of Europe, propose to establish a branch in this country, probably in Chicago. It is reported that they will employ 4000 men, and it is possible that they will start a town of their own.

The question is reviving of a coaling station in the West Indies for our navy. St. Thomas is desirable, but would be dear at the price asked, \$7,500,000.

The question of the raising of the tracks of the New York Central Railroad, at Harlem, was considered on the 16th inst. by the committees on Commerce and Navigation of the Senate and Assembly. It was conceded that the work should not

involve the closing of any more streets. The company favored a viaduct beginning at 106th street and a bridge 24 feet high.

A bill to admit to documenting vessels of foreign build has been reported favorably to the House of Representatives, and will be called up by Mr. Fithian of Illinois. The majority party are in favor of the measure, but some of the majority members represent shipbuilding constituencies.

Coal fields on the Missouri River, 75 miles above Bismarck, are in process of developing by a company which has a wealthy Englishman for president. They are said to appear inexhaustible, and the coal is said to be soft and of good quality, superior to that of Illinois or Iowa.

Remonstrances are in circulation for signatures against the control of the Lehigh Valley and New Jersey Central railroads, as an offset to the petitions to the Governor presented by the friends of the Reading Railroad.

The war steamer Mohican has been ordered from Port Townsend, Wash., to Seattle, for coal, and thence to the Bering Sea.

An official of the sugar bounty division is reported to have said that since the sugar bounty provision in the McKinley bill had gone into effect 2592 claims for bounty had been received, and with the exception of half a dozen or more claims, which were suspended for additional evidence, the sugar bounty division had passed upon and audited all the claims. These claims represent between \$6,000,000 and \$7,000,000.

The first steam vessel of large size constructed at Newport News, Va., was launched there on the 16th inst. She is named El Sud.

The Binding Twine Trust demands \$200,000, as an offset to the competition of the products of convict labor, as a condition for the use in the penitentiary at Stillwell, Minn., of the improved machines which it controls.

It is reported that the Committee on Naval Affairs of the United States Senate on the 16th inst. agreed to the proposal of the transfer of the revenue cutters from the Treasury to the State Department. At the beginning of this century the revenue cutters were more than revenue boats; they were formidable instruments of defense.

The New York Assembly is considering favorably a bill to restore hanging, in place of electrocution.

A bill to renew the *modus vivendi* in relation to bait, &c., for fishermen of the United States was passed to a second reading in the Dominion House of Commons on the 15th inst.

On the 16th inst. W. G. Oakman succeeded John H. Inman as president of the Richmond Terminal, and became chairman of the Board of Directors of the East Tennessee. The reorganization embraces the Richmond and Danville system, the East Tennessee, the Virginia and Georgia system, and the Richmond Terminal, a total of 5836 miles, including 200 miles of ocean route. The Georgia Central is not included. The new capital is stated at \$350,000,000.

The Dominion Rifle Association met at Ottawa, on the 16th inst. The Governor-General remarked upon the antiquated style of the rifles in use, and the Minister of Militia deplored the poor equipment of Canada for a defense of her rights.

The price of coal had a sudden fall at London on the 16th inst., for one of the leading firms offered it at 4 shillings below the current price, and other dealers followed the example.

Reddish brown is suggested as a suitable color for war vessels, although the retention of white is advocated on the score of comfort and health, with the adoption of some other color for substitution in preparation for hostilities.

A German engineer has paved a bridge with rubber, which is found to be more durable than asphalt and not slippery.

M. du Clos, who was sent to the United States as a revenue expert, said in Paris, on the 13th inst.: "Secretary Rusk's system is as perfect as anything can be. There are no weak points in it. Everything goes like clockwork under the direction of Mr. Hickman, who is a real savant. I visited the different pork centers, and I came to the conclusion that it is neither possible nor advantageous for anybody to pack or export a single hog that has not undergone a microscopic inspection."

At a meeting of the sales agents of the coal railroads, on the 16th inst., chestnut was advanced 25 cents to \$3.65 per ton, to even up the price of that size, which had been depressed by the efforts to dispose of an accumulated stock. Grate was at the same rate; egg, \$3.75; stove, \$3.90. The jobbing trade is allowed a reduction of 15 cents per ton from these prices.

It is rumored that our Government has received a communication from the Russian Foreign Office, protesting against arbitrating the Bering Sea question, on the ground that Russia made the sale of what is now claimed and that she did not impose upon a friendly nation by professing to sell more than she actually owned.

It is understood that the American Sugar Refining Company have obtained control of the refineries of Harrison, Frazier & Co., and E. C. Knight & Co., and have made some arrangement with that of Claus Spreckels, and that the \$25,000,000 of new stock, lately listed, was issued to accomplish the combination.

The Transatlantic Mortgage and Securities Trust, Limited, is the name of another financial syndicate, the organization of which has just been perfected at Chicago by the signing of papers. The nominal capital is reported to be \$5,000,000, with much more in reserve. The Marquis of Tweedale is reported to be the chief promoter.

A new pavement is finding its way into London, composed of granulated cork and bitumen, pressed into blocks, which are laid like bricks, and present an elastic surface, free from noise, and secure for horses' feet.

Representative Philips has presented to Commissioner Hollingsworth of the Agricultural Bureau a specimen of the Texas flax grown on a rocky knoll on the farm of John Byrne of Upshur County, including three samples representing the crude and other stages before it is ready for manufacture. The flax yielded 2 tons to the acre, valued at \$45, and hence pays better than cotton.

Great interest is shown by farmers in the northern part of the State of Ohio in sugar-beet culture and the manufacture of beet sugar. At a large meeting, held at Norwalk, on the 16th inst., assurances were given that enough beets would be raised in that vicinity to warrant the building of a large factory. A factory at Findlay also is planned.

"Sweating" has been defined to mean, in commercial usage, the sub letting of manufacturing contracts, by which the material is distributed into various homes. The objections made are that the wages paid are low to the point of oppression, and that great danger is incurred from infectious diseases in the abodes of the poor workmen.

The Iron Age

New York, Thursday, March 24, 1892.

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CHAS. KIRCHHOFF, - - - EDITOR.
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - - - HARDWARE EDITOR.
JOHN S. KING, - - - BUSINESS MANAGER.

The Causes of the Depression.

It is very plainly seen now that the iron trade is suffering from two causes of depression. Either of them would have been sufficient alone to produce demoralization, but both of them operating at the same time have a decidedly baleful effect. One is our familiar acquaintance, overproduction, and the other is the disinclination of the public to assist in the promotion of new schemes of magnitude. There have been periods in the past when overproduction was really underconsumption, but no such claim can be made now. For perhaps the first time in our industrial history our iron and steel works are equal to the full requirements of the country, even if consumption were to be more active than ever before known. Further than this, the requirements of the country, probably up to 25 per cent. in excess of what they now are, could be met without causing a serious advance in prices. If any one questions this statement, let him think for a few moments of the condition of the pig iron industry, of steel rails, of steel billets, of wire rods, of wire, of nails of all kinds—in fact, of almost any staple, save and except tin plates alone. An extravagant increase in the demand over that of any previous year would have been necessary to keep pace with the remarkable increase in productive capacity which has taken place in the past couple of years.

On the other hand, the tremendous haste with which the people of this country have been rushing into all sorts of enterprises has visibly slackened. It has given way to conservatism. The cost is being more carefully counted, and the probable financial results are more closely inquired into, than at any time since the termination of the great depression of 1873-78. There are no railroad projects of magnitude now before the public, as promoters see that they would have but a slim chance of interesting investors, even if the most enchanting pictures of rich returns could be positively shown to have a substantial basis. More than one enterprise of much real merit languishes for lack of the necessary capital, which skilled financiers have found it difficult to secure. There is some speculative excitement in a very few localities, it is true, but the feverish activity displayed there is the more noticeable by reason of the dull quiet prevailing elsewhere. This quietness would not be such a serious matter if it were not exciting apprehension among bankers and capitalists, who control the sinews of trade.

It is most ardently to be hoped that a change in the temper of the business

world may take place in time to arrest the financial chill which threatens it. There are undoubtedly good reasons for keeping up hope and looking toward the future with some degree of faith in a favorable turn in affairs. Railroad earnings are keeping up, and the prospects for continued business are so good that 1892 promises to be the best year railroads have had in a decade. Farmers are prosperous, and from present appearances are likely to continue so far at least another year, which means a great deal for a very important section of this country. The silver agitation, the reopening of the tariff question and the approaching Presidential campaign exercise a depressing influence to a considerable extent, but they should not be permitted to have too great weight with those whose business it is to forecast the future. The unexpected may accomplish vastly more in either accelerating or blighting business interests than the events which are anticipated.

The restriction of production now in progress is a great stride in the right direction. If it can be accomplished, rapidly, and if the supply can be thus quickly brought to a level with the demand, the stability of values which will be effected will restore confidence. Low prices are not an unmixed evil, and even if no advance should be established, by the restriction of production there would be an adjustment of elements of cost to correspond with the prices ruling, and manufacturers would feel safe. There is something heroic in the attitude of a manufacturer who says "We are in to stay unless something breaks," but at the same time the prudence which leads others to blow out their furnaces and shut down portions of their mills is more strongly to be commended at this time. It may take two good crops instead of one to put this country fairly on its financial feet after the great speculative period which reached its climax in 1890, and if this is to be awaited there is nothing to do but submit patiently.

Steel One Cent Per Pound.

We question whether any one familiar with the soft-steel trade would, two years since, have ventured to predict that steel billets would sell in 1892 at a figure bringing the price down to nearly 1 cent per pound, and yet it is a fact that sales have been made at \$22.50 at mill, and it is not beyond the bounds of possibility that even that figure may be shaded. Such a decline to unprecedented prices must have its effect in every direction.

The Pittsburgh-Wheeling district has been the leader in the downward movement, and has thoroughly established its supremacy over Eastern Pennsylvania, and has thus far remained unchallenged by the Chicago district, which aims at the control of its rapidly growing home markets for soft steel. Until now it has been the acid Bessemer converter which has turned out the cheap metal, but it is intimated by men who are in an excellent position to study the facts that the soft

Bessemer steel will soon find the basic open-hearth product a very serious competitor. It is claimed that with cheap stock to start with, and improvements in the handling of materials, basic open-hearth steel will soon be made as cheaply as acid Bessemer. It is probable that the East, where the latter is relatively higher than in the West, will be the scene of the first contest.

If the hopes are justified of those who are interested in the basic open-hearth, then the soft-steel trade will become less dependent upon the condition of the rail trade, because it would not then, as it does now, draw its raw materials from practically the same sources. There might be an enormous demand for rails, coupled with high prices of Bessemer low-phosphorus pig, and yet soft steel could be produced at relatively low prices.

The Labor Outlook in Chicago.

The annual labor agitation in Chicago is now in active progress. The opening of the building season is close at hand, and the labor leaders would find their occupation gone if they were to permit the resumption of outdoor work to take place without some manifestation of their ability to create trouble. For some time meetings have been held nightly in nearly every branch of trade connected with building construction. It is reported that labor agitators from Eastern cities are on the ground working zealously to foment uneasiness and discontent in quarters which have been hitherto comparatively free from disturbances. Last year's strikes were almost without exception unproductive of benefit to workingmen, but they do not seem disposed to learn the lesson which that unpleasant experience should have taught them. The bricklayers are almost alone in exercising full control in their branch of trade. The carpenters have a strong organization, but they have not been able to wield the power of which their leaders fondly dream. They effected a compromise with part of the contractors and builders last year, but it was not closely adhered to, and the union had but little influence when the season was well advanced. The iron workers, stonemasons and cabinet makers were badly worsted in their contest for shorter hours and higher wages.

All this ground is apparently to be fought over again. The carpenters are thoroughly organized and well provided with funds, and mean to establish a uniform regulation of hours and wages without regard to the damage which may be done to great business interests of the city. The iron workers and cabinet makers are anxious to try the contest over again, and claim that they are better organized than before. The journeymen plumbers are also demanding higher wages, as their two year agreement has expired, and threaten to strike if their demands are not conceded. The chances seem strongly in favor of a condition of complete chaos among the building interests of Chicago by May 1 if wise counsels

do not prevail in the meantime in the conferences which are to take place between committees of employers and workingmen.

A general strike this spring of any great duration would be a most unfortunate thing for Chicago. Very important undertakings are on foot in preparation for the World's Fair, outside of the work now in progress on the World's Fair grounds. It is not likely that any interference with or hindrance to the construction of the buildings will be permitted, as the fair managers cannot afford to have the completion of that work in time for the formal opening endangered. But throughout the city itself there is much to be done by private enterprise. It may be taken for granted that no trifles will be allowed to stand in the way of an adjustment of differences, but, on the other hand, it is doubtful whether contractors and builders will be willing to concede what may cripple them in their operations in the years to follow. There is a point at which exasperation sets in, when unreasonable demands are pressed, and then a man stands on his manhood whether he be a workingman or only an employer.

OBITUARY.

CHARLES J. VAN DEPOELE.

Charles J. Van Depoele, the first to adapt electricity to the work of mining and projector and inventor in the line of electric railroading, died on the 18th inst. in Lynn, Mass. He was 46 years old.

Mr. Van Depoele was born in Belgium, and at an early age displayed great interest in machinery and in electrical matters, but his parents discouraged his investigations in this line and apprenticed him to the cabinet-making trade. Going to Detroit in 1869, he began the manufacture of art furniture, and from that time on for several years he spent all of his leisure and much of his revenue from the furniture business in electrical experiments. In 1877 he built an electrical laboratory, and there constructed several large dynamos, with which exhibitions were given. In 1878 he lit up Forepaugh's circus, and after that Recreation Park was illuminated nightly for the benefit of the baseball enthusiasts. A great hobby of his was the propulsion of cars by electricity, in which his first experiments were made in 1882. His first commercial road was equipped in 1885 at South Bend, Ind. In the spring of 1888 the Van Depoele Company sold out to the Thomson-Houston Electric Company of Boston, whose service Mr. Van Depoele thereupon entered as electrician of the railway department.

WILLIAM REA.

William Rea of the Robinson-Rea Mfg. Company of Pittsburgh died at his residence on Penn avenue, Homewood, in that city, on Wednesday, 16th inst., in the seventy-second year of his age. Mr. Rea was one of the oldest manufacturers in Pittsburgh, the firm of which he was a member having been organized many years ago. During the war it turned out a large number of field pieces for the Union army, but of late years it has confined itself exclusively to rolling-mill castings of all kinds.

Appraisements of different Rocky Mountain lead smelting plants are being made in the interest of the National Lead Com-

pany, who seem determined to become great producers as well as great consumers of pig lead.

PERSONAL.

Edward Fitz Gerald, who has for six years been general manager of the Antim Iron Company, manufacturers of charcoal pig iron at Mancelona, Mich., has resigned to accept the position of general manager of the lumber operations in New Mexico of Mitchell Brothers.

During last week a number of changes and promotions have been made in the heads of departments of the Homestead Steel Works of Carnegie, Phipps & Co., Limited, at Homestead, Pa. They are as follows: Joseph Skewis, who for a number of years has been manager of the Bessemer department, will take charge of the new beam mill. Taylor Alderdyce will succeed Mr. Skewis. Nicholas Rattigan, who was superintendent of the converting mill, will succeed Mr. Alderdyce.

The party who visited the property of the Sigua Iron Company, Cuba, including H. S. Chauvenet of Philadelphia, returned last week.

John Male has resigned from the superintendence of the Albany Iron Works, Troy, N. Y., to take effect April 1. William J. Bradley will succeed him and Robert T. Tunnard will become assistant superintendent. Mr. Male has sailed for England.

Howard W. Yccum of Pottstown, Pa., for two years connected with the Reading Iron Company, has accepted the position of manager of the blast furnace of the

The Cast-Iron Pipe Industry.

BY DR. WILLIAM M. SWEET.

The manufacture of cast-iron pipe is one of the leading branches of the foundry industry in the United States, the business being confined almost exclusively to establishments devoted to this class of work as a specialty. On account of the distinctive character of the industry it has been possible to separate the statistics of the pipe works from the operations of foundries engaged in the production of miscellaneous castings. A comparatively small amount of iron pipe is made by foundries devoted to general work, but as the pipe thus produced is chiefly for local trade or for specific purposes, no account has been taken of the output in this bulletin. The character of the demand for standard sizes of cast-iron pipe necessitates its manufacture on a large scale in plants especially equipped for this work, although many of them also produce hydrants, fittings and connections. A few of the pipe manufacturers make hydraulic and gas machinery and general foundry and machine shop products, but this work forms only a small part of the aggregate business of these establishments.

During the census year 1890 there were 36 establishments in the United States reported as engaged principally in the manufacture of cast-iron pipe, and of this number 34 were in operation in that year. The statistics of this industry in 1890 are summarized in the following table. In the census of 1880 the statistics of the cast-iron pipe works were included with the other foundries, and comparisons with that period are therefore not possible.

States.	Number of establish- ments.	Capital invested.	Average number of hands em- ployed.	Wages paid.	Cost of materials.	Value of products.
New York and the New England States	3	\$689,463	338	\$163,244	\$292,361	\$516,421
New Jersey	6	4,543,204	2,298	1,217,813	3,105,401	5,432,571
Pennsylvania	48	1,390,107	711	341,639	979,685	1,491,808
Southern States	8	3,561,162	2,024	957,141	2,256,258	3,714,203
Ohio	4	1,950,311	1,94	550,054	1,405,425	2,189,565
Other Western States	7	2,266,686	1,323	584,496	1,444,239	2,224,027
Total	130	\$14,300,933	7,788	\$3,794,407	\$9,483,389	\$15,168,682

a Includes two establishments reporting \$68,500 capital, which were not in operation during the census year 1890.

Temple Iron Company at Temple, Pa., to succeed W. H. Clymer, resigned, who has become identified with the Phoenix Iron Company at Phoenixville, Pa.

Andrew Carnegie is expected in Pittsburgh on Thursday, returning from his trip to Mexico and the Pacific Coast.

The March report of the Statistician of the Department of Agriculture, issued on the 18th inst., shows that the production of cotton of the world exceeded the consumption more than 1,500,000 bales in 1890, and further greatly enlarges the excess in 1891, glutting the markets, increasing visible stocks during the past year more than 1,100,000 bales, and reducing the Liverpool price of middling upland from 6½d. in January, 1890, to 4½d. in January, 1892. It states that in two years this country has produced an excess above normal requirements of more than 2,000,000 bales, and indicates a heavy reduction in breadth as the only possible remedy; otherwise the agriculture of the South will suffer worse than the agriculture of the West ever has. It declares that the cotton States must be agriculturally self-sustaining; that new crops must be introduced, as the agricultural population has outgrown the capacity of cotton to support it.

In the tabulation of individual reports for the cast-iron pipe industry no account has been taken of the miscellaneous items of expense incurred in manufacture other than expenditures for wages and materials. This was found necessary because the data reported in several instances include charges belonging to other branches of business conducted in connection with the manufacture of pipe, the separation of such charges being impracticable.

It has been found necessary to group a number of States in order to avoid disclosing the operations of individual establishments. Of the works located in the Southern States two are in Virginia, two in Kentucky, two in Tennessee, one in Alabama and one in Texas. Of the eight establishments in operation in this section in 1890, five have been built since 1880. The works grouped under the head "Other Western States" include two in Missouri, and one in Illinois, Michigan, Wisconsin, Colorado and Oregon, respectively. Of these seven establishments six have been built and put in operation since 1880.

The oldest seat of the cast-iron pipe industry is in eastern Pennsylvania and the adjoining sections of New Jersey, the largest works being located in the immediate vicinity of Philadelphia, Pa. One establishment, situated at Millville, N. J., has been in operation since 1803, and has been conducted by the same in-

terests since its organization, but it did not begin the manufacture of pipe until some years later. Two other works in this section were established prior to 1850, and five works were built and put in operation between 1850 and 1880. During the last decade five cast-iron pipe foundries have been built in this territory. The older establishments in this section are all of large size, while those recently built are of comparatively small capacity. During the census year 1890 the pipe foundries in eastern Pennsylvania and New Jersey produced 43 per cent. of the total output. Until within recent years these works supplied the demands of almost the entire country, but the advance in municipal improvement in the West and Southwest and the growth of the pig iron industry in those sections have resulted in the establishment of large plants nearer to the new markets and at points where pig iron and fuel can be cheaply obtained. The cost of transportation is a very important factor in the cast-iron pipe industry, and tends, with the wider distribution of the industry and the increasing competition, to restrict the trade of each establishment to a limited territory.

Although it has been found impossible to obtain any accurate statistics concerning the manufacture of cast iron pipe during the census year 1880, the growth of the industry during the past ten years is indicated by the large number of establishments erected since 1880. Of the 36 establishments reporting for 1890, 20 were built since 1880 and 16 were erected prior to that year. By far the larger number of the works built during the last decade are located in the Southern and Western sections of the country, and the majority of them are establishments of large capacity.

Labor and Wages.

In the following table are given the average number and aggregate salaries of officers and clerks and the average number and aggregate earnings of skilled and unskilled labor and piece hands employed in the cast-iron pipe industry in the census year 1890:

Classes.	Aggregate.		Males above 16 years.		Children.	
	Average number employed.	Total wages paid.	Average number employed.	Total wages paid.	Average number employed.	Total wages paid.
Officers or firm members.	71	\$189,415	71	\$189,415	.....	.....
Clerks or salesmen.	102	92,646	102	92,646	.....	.....
Skilled workmen.	2,565	1,589,680	2,565	1,589,680	.....	.....
Unskilled workmen.	4,787	1,773,712	4,754	1,767,394	33	\$6,318
Piecework.	263	148,964	263	148,964	.....	.....
Total (a).	7,758	\$3,794,407	7,775	\$3,788,080	33	\$6,318

a Includes convict laborers at the Texas penitentiary, receiving an average of 50 cents each per day.

The following table gives the weekly rates of wages and the average number of hands employed at each rate during the year, not including those employed at piecework:

Rates per week.	Males above 16 years.	Children.
Under \$5.	215	12
\$5 and over, but under \$6.	121	9
\$6 and over, but under \$7.	654	.....
\$7 and over, but under \$8.	1,321	.....
\$8 and over, but under \$9.	1,358	.....
\$9 and over, but under \$10.	1,023	.....
\$10 and over, but under \$12.	896	.....
\$12 and over, but under \$15.	940	.....
\$15 and over, but under \$20.	689	.....
\$20 and over, but under \$25.	157	.....
\$25 and over.	118	.....
Total (a).	7,492	33

a Includes convict laborers at the Texas penitentiary, receiving an average of 50 cents each per day.

During the census year 1890 the cast-iron pipe foundries were in operation an average of ten months each. The average term of employment for men was 11 months, and for children 10.6 months, the excess of the average term of employment over the average term of operation being caused by the fact that the establishments employing the greater number of hands also report the maximum term of operation.

Materials Consumed.

In the following table are given the total quantity and cost of the pig iron used, and the total cost of the fuel and other materials consumed by the cast-iron pipe works during the census year 1890:

States.	Pig iron. Tons of 2,000 lbs.	Cost of pig iron.	Cost of fuel.	Cost of other materials.	Total cost of all materials.
New York and the New England States.	12,524	\$188,825	\$23,372	\$0,164	\$202,361
New Jersey.	199,568	\$2,603,297	\$202,712	\$299,392	\$3,105,401
Pennsylvania.	58,446	\$856,932	\$54,078	\$8,675	\$979,685
Southern States.	146,263	1,920,200	156,520	179,538	2,256,258
Ohio.	90,813	1,156,617	122,537	126,271	1,405,425
Other Western States.	83,644	1,134,537	102,936	206,786	1,444,259
Total.	591,258	\$7,860,408	\$662,155	\$960,826	\$9,483,389

Most of the works used pig iron exclusively in the manufacture of pipe, a few of the establishments reporting the consumption of a small quantity of purchased scrap iron, the cost of which is included in the "cost of other materials," which also covers the amount paid for miscellaneous foundry supplies and for materials consumed by a few of the works in the manufacture of products other than cast-iron pipe.

Products Made.

The quantities and values of cast-iron pipe made during the census year 1890 are given in the following table, together with

manufacture of this class of products forms in itself an important industry.

No account has been taken in this statement of a number of works that were in course of erection during the census year 1890, but which were not completed and put in operation during that year. Since the close of the census year six new pipe foundries have been completed and put in operation, all in the Southern States, one being in Virginia, four in Alabama and one in Texas.

Atkinson Steel and Spring Works Trouble.

Michael Schweisthal, a Chicago banker of hitherto high standing, made an assign-

ment last week. The fact then became public that an intimate connection existed between his bank and the Atkinson Steel and Spring Works, through the filing in the Superior Court of confession of judgment for \$52,100 against the Atkinson Steel and Spring Works, and in favor of J. W. Lanehart as assignee of the Schweisthal Bank. The judgment notes were given August 22, 1891, to secure collateral already in the hands of the bank. No levy was made, but the Sheriff was instructed to make a demand. Examination showed that the bank was further secured by 46 \$1000 bonds of the company, secured by a trust deed on the plant, and by \$16,000 worth of shares in a Minnesota land company.

On a bill filed by Gustav Baurmann in the Circuit Court, Judge Collins appointed the Jennings Trust Company receiver for the Atkinson Steel and Spring Works. Baurmann is a stockholder and avers that the corporation has a capital stock of \$300,000, divided into 3000 shares. He is the owner of a majority of the stock. The plant of the company is located at Harvey on 10 acres of land worth \$3000 per acre, and is the property of the corporation. The value of the plant is said to be \$200,000. But for the failure of the bank it is said that the corporation would have been able to meet its obligations. The company have on hand raw and partly manufactured materials of the value of

States.	Tons of pipe.	Value of pipe.	Value of other castings.	Value of other products.	Total value of all products.
New York and the New England States.	13,066	\$412,382	13,950	\$90,080	\$516,421
New Jersey.	185,510	4,288,816	364,561	374,194	5,082,571
Pennsylvania.	48,460	1,188,090	223,715	75,000	1,491,805
Southern States.	128,253	3,178,175	491,568	44,560	3,714,283
Ohio.	73,734	1,829,680	304,030	55,855	2,189,565
Other Western States.	64,007	1,649,172	404,355	170,000	2,224,027
Total.	513,000	\$12,556,315	\$1,802,679	\$809,688	\$15,168,683

The item of "other castings" is made up chiefly of pipe fittings and specials, and also includes some general foundry products. The "other products" embrace valves, gates, hydrants, gas and water machinery and miscellaneous machine work. The gates, valves and hydrants made by the pipe foundries constitute only a small portion of the aggregate production of these fittings, as the

\$60,000, book accounts not yet due for \$30,000, and contracts to be filled amounting to about \$75,000. If the execution is allowed to be levied it will ruin the business, while the unfinished material, if allowed to be made up, will bring \$60,000. The Atkinson Company procured an injunction restraining the Sheriff from making a levy or interfering with the business.

The Affairs of James P. Witherow.

Under date of March 11, Alexander Thomas, German National Bank Building, Pittsburgh, Pa., assignee of J. P. Witherow, furnished the creditors of Mr. Witherow with a financial statement:

Financial Statement, March 11, 1892.

	Accounts in dispute and liquidation.	Accounts as shown by the books.
New Castle property:		
Real estate	\$60,000.00	
Buildings	87,000.00	
Machinery, &c	281,825.59	
Material and tools	76,500.00	
	<hr/> 505,325.59	
Stocks and investments:		
Buena Vista Iron Co.	20,000.00	
Graham Furnace Co.	20,000.00	
Florence Cotton and Iron Co.	10,000.00	
Florence Development Co.	12,500.00	
Duquesne Land Co.	1,000.00	
Haskins Wood Vulcanizing Co. bonds	4,000.00	
Haskins Wood Vulcanizing Co. stock	10,000.00	
Sewickley Dairy Co.	5,000.00	
Valentine Iron Co.	15,000.00	
Valentine Iron Co.	2,500.00	
Clapp & Griffiths Steel Co.	67,500.00	
Fire Brick Hot Blast Stove Co.	20,000.00	
	<hr/> 187,500.00	
Bills receivable:		
John L. Stevenson	500.00	
Thos. B. Kerr	2,500.00	
Columbia Iron and Steel Co.	1,102.98	
J. R. Williams	100.00	
James Meily	450.00	
Geo. W. Bryan	300.00	
	<hr/> 4,952.98	
Accounts receivable at creditors' meeting classed as good:		
Robesonia Iron Co.	803.95	
Graham Furnace Co.	1,928.62	
Rome Iron Co.	3,339.80	
Carnegie Iron Co.	9,945.41	
Florence Cotton and Iron Co.	1,494.93	
H. W. Hargraves	505.47	
Bristol Iron and Steel Co.	53,848.66	
Sundry accounts	<hr/> 71,866.84	
	<hr/> 6,180.43	
	<hr/> 78,047.27	
Accounts receivable at creditors' meeting classed as doubtful:		
International Boiler Co.	16,128.12	
DeBardleben Coal and Iron Co.	9,074.50	
Robert Hare Powell's Sons & Co.	62,669.73	
Port Henry Iron and Steel Co.	12,592.23	
Valentine Ore Land Association	14,193.80	
Gadsden, Ala., Furnace Co.	4,393.80	
Sundry accounts	<hr/> 119,052.18	
	21,116.44	
	<hr/> 140,168.62	
Watts Steel and Iron Syndicate, Limited	68,547.06	
Sheffield Furnace Co.	<hr/> 82,864.08	
	<hr/> 151,411.14	
Receiver's accounts:		
Gracey-Woodward Iron Co.	3,522.16	
Bristol Iron and Steel Co.	1,582.15	
Carnegie, Phipps & Co., Limited	969.04	
J. H. Miller	54.75	
Graham Furnace Co.	81.00	
Florence Cotton and Iron Co.	129.38	
	<hr/> 6,338.48	
Cash in bank	1,893.31	
Total	<hr/> 347,434.47	
	<hr/> 1,075,637.39	
LIABILITIES:		
Accounts payable	249,602.26	
Mortgage and interest	79,500.00	
Collateral security	15,000.00	
Receiver's certificates	10,000.00	
	<hr/> 354,102.26	

Accounts receivable, in dispute or litigation, have undergone considerable al-

teration, and show, according to the face of the books, that \$347,434.47 of the accounts receivable, including the Watts matter, are involved in disputes and litigations. The Sheffield Furnace Company claim, amounting to \$82,864.08, which was regarded as good, and against which W. B. McCormick holds a claim for about \$10,000, the attorney in charge, Hon. Wayne MacVeagh, advises is very uncertain. The Bristol Iron and Steel Company claim has been increased from \$19,623.70 to \$55,430.81 by charging back unpaid note, unaccepted drafts and subscription to their stock, with which they had been credited, and interest to February 1, 1892. A mechanic's lien has been filed against their property in Virginia for the full amount of the balance due the estate, and a determined effort will be made to collect. The Watts Steel and Iron Syndicate contract is the only important one not completed. The amount, \$68,547.06, as it stands on the books, represents not the amount due, but the difference between the contract price and the credits made on the account. The cost of completing the contract with materials now on hand is estimated at from \$30,000 to \$45,000, which would leave a balance payable to the estate of \$20,000 to \$35,000. Some allowances may have to be made on account of delay and other causes which may materially affect these figures. However, the Watts Company seem disposed to be reasonable, and a satisfactory adjustment of all differences is confidently expected. The Carnegie Iron Company and Gracey-Woodward Iron Company claims, it is believed, can be settled without litigation. The other items under this heading not specially mentioned here are so involved in questions of law and fact that it is difficult to estimate what may be realized from them. They are receiving careful study and attention, however, and much will depend on the manner in which they are handled.

The McCullough Iron Company.

Enoch McCullough, John W. McCullough and Henry Whiteley have filed a lengthy answer to the bill filed by the Fidelity Insurance, Trust and Safe Deposit Company, trustee, under the will of Delaplaine McDaniel, deceased. We quote the following from the document in question:

This bill of complaint has been filed by a minority stockholder. It is filed against the protest and wishes of the large majority of the stockholders of the corporation defendant, and it has been filed at the instigation of Joseph L. McDaniel, the president of the company, and the brother of the complainant's *cestuis que trusts*, and its various allegations have been inspired by and are in fact the allegations of the said Joseph L. McDaniel.

In 1874, J. J. McCullough, E. A. Harvey and Delaplaine McDaniel formed a partnership known as McCullough & Co. The firm owned but one small mill, which was at North East, Cecil County, Md. The business prospered and enlarged, and in 1863 the firm was incorporated as McCullough Iron Company of Cecil County, Md. In 1865 it was reincorporated as the McCullough Iron Company, and has since been continuously engaged in business. It has been a flourishing and prosperous company. From time to time its profits and losses have fluctuated in accordance with the general demand for iron and the general condition of business prevailing at divers times. It has distributed in dividends among its stockholders \$1,075,000, and has always promptly met its obligations. Since 1890 Mr. Joseph L. McDaniel has acted as the president of the company. He is the author of the statement which is

annexed to the plaintiff's bill of complaint, and the source from which the facts stated in the said bill have been derived. He is the brother and son of the *cestuis que trusts* represented by the complainant, and has always voted the stock of the complainant under a proxy given by the said complainant, the said stock never having been voted by any other person until the meeting of February 16, 1892. The said Joseph L. McDaniel has acted as the purchasing and selling agent of the company and its subsidiary branch, the McDaniel & Harvey Company, and for business reasons satisfactory to the majority of the stockholders, it was the intention of the said majority of the stockholders and of the Board of Directors to elect a successor in his place at the forthcoming annual election to be held on April 12, 1892. For the purpose of preventing this action the said Joseph L. McDaniel called a special meeting to listen to the report which is annexed to the complainant's bill, and which is wholly at variance with the true facts in the case, and with the facts as previously stated by the said Joseph L. McDaniel himself.

The general business which the company conducts is of two kinds—(a) it manufactures what is known in the trade as Harvey's patent cleaned black sheet iron, and (b) it also manufactures what is known in the trade as charcoal bloom sheet iron. The former is manufactured by puddling furnaces and the latter by charcoal forges. The bloom iron is principally used for galvanizing purposes. Prior to 1878 the galvanizing was done directly by the McCullough Iron Company, but in that year a subsidiary corporation, known as the McDaniel & Harvey Company, was organized, and part of the property of the McCullough Iron Company was conveyed to it for the purpose of carrying on the galvanizing business under a separate and distinct department, the stockholders of the McDaniel & Harvey Company being the stockholders of the McCullough Iron Company in the proportion of one share of the McDaniel & Harvey Company to every two shares of the McCullough Iron Company. They have always been treated as practically one corporation.

The manufacture of Harvey's patent cleaned black sheet iron by the defendant has always been profitable, with the exception of the years 1886 and 1887, when, owing to labor troubles, a loss was caused. The bloom iron manufactured by this defendant has always held a high reputation in the market, and is of the first quality of sheet iron manufactured. Of late this business has not shown profits upon the books of the company, owing to large expenditures being annually made for repairs and improvements in the existing plant and the low price of steel billets and sheets.

With a view of remedying this, the directors have, for the last year or more, been engaged in considering the proper method of more fully utilizing these two mills. Several courses have presented themselves to the board, and are now being considered. One of these courses is to devote the mills, temporarily or otherwise, to the manufacture of Harvey's patent cleaned black sheet iron, which has always been a most successful branch of this company's business. The mills could easily be adapted to the manufacture of this iron and at but slight expense. Another method is to manufacture sheet iron by means of what is technically known as a "tight" mill, as distinguished from the present process, the mills now being known as "loose" mills. The object of a tight mill is to roll steel sheets of lighter gauges than possible with our present mills. The mills could be adapted to this process by appropriate alterations. Accordingly, on December 2, 1891, three months before this bill was filed, the fol-

lowing resolution was passed, the said Joseph L. McDaniel voting therefor:

Resolved, That a committee of four, with the president as a member *ex officio*, be appointed to consider the advisability of building a tight mill at this time.

According to the foregoing resolution, the president named E. A. Harvey, E. McCullough and George W. McCullough as the remainder of said committee.

On January 13, 1892, a report upon the cost of the proposed alterations was made and the committee reported progress, and on February 3, 1892, the following resolution was unanimously adopted:

Resolved, That it shall be the policy of this company to build or acquire a tight mill or mills to supply them with steel or iron sheets for galvanizing, and that the Committee on Tight Mill be instructed to proceed to ascertain the best means to raise sufficient funds for the purpose, and to report concerning the same at the next meeting, or at a special meeting called for that purpose, if deemed necessary.

Another method is to place our blooms upon the open market and sell the same, as many other corporations engaged in a similar manufacture are doing.

The defendant denies that the McCullough Iron Company is not in a position to compete with other corporations manufacturing the same line of goods, and that it is not now conducting with success or benefit to its stockholders the business for which it was incorporated. On the contrary, we aver that at the Minquas Mill alone we made a manufacturing profit of \$21,000 last year, and that at the North East and Octoraro mills we made a manufacturing profit of \$8000, and that the apparent loss of \$4000 in the total business for the year was caused by the expenditures for the permanent improvements above named. Dividends amounting to \$30,225 have also been declared since 1885 upon the stock of the McDaniel & Harvey Company, a subsidiary company, as hereinafter stated in the seventh paragraph of this answer. And we further aver that the alterations and changes above noted, which are in contemplation of construction previously recited, will result in still further increasing the profitable business of this company.

And the defendant shows to the court that the statement of the complainant as to the reduction of the surplus, and also the statement as to this of the said Joseph L. McDaniel, upon which the bill is founded, are misleading. In the first place, the surplus upon which the complainant so greatly relies was created in great part in the year 1885 by a credit from the McDaniel & Harvey Company of \$128,900, and the complainant, while relying upon this surplus thus created, now objects to similar credit made upon precisely the same basis. In the next place, the period of time taken is far too short an interval to determine the nature of the general prosperity of the company. Thus, in 1878 the company was without any surplus and owed \$300,000 exclusive of its capital stock, and had this complainant taken the year 1878 as a starting point for its computation whereby to determine the present condition of the company, the result would have shown that this defendant is to-day over \$300,000 better off than it was at that date, and that it has, in addition, enormously increased its business, and has further paid and distributed among its stockholders \$325,000 as dividends since that date. In fact, the said Joseph L. McDaniel himself, in his written report of April 14, 1891, to the stockholders, reported that a period of five years from April, 1890, must necessarily intervene before any satisfactory conclusion could be drawn as to the future improvement of the company.

Moreover, the surplus has not been reduced in the manner in which the com-

plainant would lead the court to infer. Of the apparent reduction \$36,000 has been distributed among the stockholders as a distribution of the said surplus. Twenty-eight thousand dollars additional of the apparent reduction of surplus was caused simply by a revaluation and lowering of values of property and stock now, as then, on hand. The losses by the act of God, viz., by fire and flood, amounted to \$12,000. The labor troubles in the years 1886 and 1887 caused losses over \$30,000 additional. Judgments amounting to \$3800 were also recovered against the company. Over \$50,000 has been expended at the North East Mill alone in changes and permanent improvements, and large sums have also been devoted to permanent alterations, in accordance with modern progress, at all the other plants and mills belonging to the company defendant.

So, too, the Minquas Mill, being the property of this defendant, has been mortgaged to pay for improvements, additions and alterations to the plant of its subsidiary company, the McDaniel & Harvey Company, to the amount of \$25,000.

VII. This defendant emphatically denies that the credit of \$48,408.34 recited in the seventh paragraph of the complainant's bill of complaint is a false and fraudulent credit, or is anything else than a true and proper entry in accordance with the usual course of business existing between the McCullough Iron Company and the McDaniel & Harvey Company, and in accordance with the course of business instituted by Delaplaine McDaniel, the father of the *cestuis que trusts*, and which has been continuously done for the past 13 years.

No price was ever definitely agreed upon between the two companies for the value of the products delivered by the McCullough Iron Company to the McDaniel & Harvey Company to be galvanized, because there was no necessity for definitely fixing such price. All sales were made by the McDaniel & Harvey Company, and the proceeds thereof appear solely upon their books. This course of business naturally led to an apparently large profit in the McDaniel & Harvey Company, and apparent loss in the McCullough Iron Company, as the entire profit was credited to the McDaniel & Harvey Company, being the proceeds realized by sales to the public, and dividends have been declared in the McDaniel & Harvey Company amounting to \$30,225. Accordingly, from time to time, and with the knowledge and consent of all parties, transfers of balances were made from the McDaniel & Harvey Company to the credit of the McCullough Iron Company. These were usually made at various intervals, and were a means of equalizing the profit or loss apparently sustained by the McCullough Iron Company in thus supplying to the McDaniel & Harvey Company the goods which the latter sold.

In strict accordance with this course of business, on January 1, 1889, the apparent bookkeeping indebtedness of the McCullough Iron Company to the McDaniel & Harvey Company was adjusted and equalized by an allowance from the McDaniel & Harvey Company of \$48,408.34, and an entry thereon made upon the books of the McDaniel & Harvey Company, and upon the books of the McCullough Iron Company upon the same date.

The defendant denies that the transfer was made without consideration, or for any fraudulent purpose whatever, or that it was in any sense a misapplication of the funds of the McDaniel & Harvey Company. We further deny that the entry was not known to the president of the two companies until after January 1, 1892. Such statement is wholly untrue. On the contrary, all the officers discussed the said entry and were thoroughly familiar with it, and have been so for over three years.

Moreover, on April 8, 1890, at the annual meeting of the McCullough Iron Company, the treasurer's report was read containing express reference to the "amount received from McDaniel & Harvey Company in adjustment, \$48,408.34," and on motion the same was accepted and ordered to be placed upon the minutes. The complainant's stock was present at that meeting and represented by proxy held by Joseph L. McDaniel, and the latter voted the said proxy and as secretary of the said meeting signed the minutes of the said meeting, which contained the entry in full, and on April 15, 1890, at the annual meeting of the stockholders of the McDaniel & Harvey Company, of which the said Joseph L. McDaniel was then president, the said item was again presented and read in full to the stockholders and approved by them and spread upon the minutes, and at this meeting the complainant's stock was also represented and voted by the said Joseph L. McDaniel, who was personally present, and who has been familiar with the said entry and transfer from the date it was made—viz., January 1, 1889—until the present time. The entry was, moreover, made as of its date, and the books have been, ever since the said entry, open to the inspection of the stockholders at all times. On February 16, 1892, immediately after reading the statement which is annexed to the complainant's bill, and being over three years after the equalization had thus been made, the said Joseph L. McDaniel, in violation of his duty as the executive officer of the board, and without communicating his purpose to the board or any of the stockholders of either the McCullough Iron Company or the McDaniel & Harvey Company, secretly instructed the bookkeeper to make a counter-entry in the books, charging back the said sum of \$48,408.34 to the McDaniel & Harvey Company.

The defendant has recently had a revaluation of the company's entire property made by disinterested, competent experts appointed in pursuance of the stockholders' resolution of February 16, 1892, hereafter referred to. The appraisement of the existing mills of the company, and plant connected therewith, has been made by John Birkinbine, president of the American Institute of Mining Engineers, and personally familiar with the property, having been employed by Mr. Delaplaine McDaniel as consulting engineer of the McCullough Iron Company, and by F. Lywood Garrison, an expert in iron and other metals, and a manager of the Franklin Institute and other societies.

The real estate owned by the company, in addition to the real estate used for the purposes of the company's existing plants, has also been separately appraised by persons familiar with the value of real estate in the different localities. The appraisements are minute and in detail, and in the aggregate are as follows:

Minquas mill and plant	\$214,000.00
North East mills	\$94,500.00
Shannon mill	13,500.00
	108,000.00
Charbon works	24,800.00
Real estate, North East and Charbon	45,397.00
Octoraro mill and plant	39,000.00
West Amwell mill and buildings	8,750.00
Real estate, West Amwell	10,070.00
Making altogether	\$450,617.00
In addition to this there is stock on hand valued on the books of the company at	131,146.13
Total	\$581,763.13
And in addition to this there are other assets of the company, consisting of book accounts, bills receivable, &c., amounting on January 1, 1892, the last date at which the balance sheet was taken, to	60,710.85
Total	\$642,473.98

And this defendant avers that the above is a low value of the complainant's present property, and that machinery, tools, &c.,

similar to that now owned by the complainant could not be replaced for a sum from 30 to 50 per cent. in excess of the values fixed by the appraisers, and that the appraisal does not embrace any allowance for good-will or established trade.

And also as late as October, 1891, the said Joseph L. McDaniel presented to the Board of Directors figures and appraisements of the company's property, showing, as he claimed, that the company could pay its capital stock at par.

And he has within five months reported that the stock was worth not less than par, and has borrowed upon his shares of stock upon such representation.

And this defendant avers that the majority interest of its stockholders did, on March 18, 1892, tender to the complainant the full value of its stock based upon the value stated in the bill, and the complainant declined to receive the same. This is hereinafter fully set forth in the tenth paragraph of this answer.

IX. The stock on hand at the mills was, on January 1, 1892, valued on the books of the company at \$131,146.18. This is a just and low appraisal. The defendant knows no reason why 20 per cent. should be deducted therefrom as stated by the said complainant, nor does the complainant in its bill give any reason therefore.

X. The true financial condition of the company defendant, without allowance for good-will and established trade, and at values for machinery of from 30 to 50 per cent. less than it would cost to replace our present machinery, is as follows:

Assets of the company as hereinbefore stated in the eighth paragraph of this answer.....	\$642,473.98
Total liabilities of the company as of January 1, 1892.....	118,019.54
Excess of assets over liabilities.....	\$524,454.44
Being the amount applicable to the redemption of capital stock. And deducting from this the capital stock of the company.....	450,000.00
Leaves a surplus for distribution after payment of capital stock in full of	\$74,454.44

The defendant denies that the capital stock of the company has been impaired to the extent of \$275,300.13, or to any extent whatever, and we emphatically deny that the company is in any manner insolvent.

And the defendant avers that the majority of the stockholders have been recently requested to name a figure at which they would sell their stock, and they have declined to sell the same for less than par.

And the defendant further avers that on March 18, 1892, Messrs. McCullough and Harvey, representing the majority interest of the stockholders of the corporation defendant, tendered to the complainant the full amount which the complainant in its bill swears that its 1002 shares of stock are worth, viz., \$38,907.66, and that the complainant declined to receive the said amount therefor, or to part with its shares at any such valuation. And the defendant further avers that the said McCullough and Harvey do now and herein repeat the said offer and tender, and are willing and anxious to purchase the said stock at the said price. The value of the stock is thus ascertained by the sworn statement of the complainant viz.: the complainant in its bill swears that the capital stock of the company has been impaired to the extent of \$275,300.13, and that there is, therefore, only left for redemption of the said capital stock the sum of \$174,699.87, which makes the value of each share of stock \$38.83, or for the complainant's 1002 shares the sum of \$38,907.66, and if the complainant's allegations are true, this value would, of course, be subject to be still further reduced by the expense of this proceeding, and the

fees, costs and charges incident to a compulsory winding up through a receivership. But the above amount, thus ascertained by the complainant itself, and without deduction, has, as aforesaid, been tendered to and declined by the said complainant.

The defendant denies that the capital stock of the company has been in any manner impaired, and we deny that any previous loss has been incurred by any dereliction of duty on the part of the Board of Directors. Such apparent loss has been caused solely by reason of the facts hereinbefore fully set forth.

MANUFACTURING.

Iron and Steel.

Anna Furnace, at Struthers, Ohio, operated under lease for a number of years past by the Struthers Furnace Company, has blown out indefinitely.

The Stewart Wire Mills at South Easton, Pa., are to be enlarged. The plant will be operated by a stock company with a capital of \$400,000, and the additional stock of \$125,000 thus acquired will be expended in making improvements.

The Northampton Furnace of the Bethlehem Iron Company, Bethlehem, Pa., has been blown out for repairs.

At a recent meeting of the stockholders of the Montour Iron and Steel Company of Danville, Pa., it was voted to increase the indebtedness of the corporation to \$500,000, and to issue bonds to that amount, to be secured by a mortgage of their property, corporate rights and franchises. Needed improvements to the plant will be made.

The Oxford Iron and Nail Company of Oxford, N. J., have given notice that their works will close on April 1. The company own the Oxford Furnace and operate a nail works, giving employment, when in operation, to about 800 men. The furnace has been idle for some months past, and a strike of the puddlers on November 1 last caused the closing down of the nail mill in December, since which time all departments have been idle. A State board of investigation was appointed by the Legislature of New Jersey to inquire into the difficulties existing between the company and their employees. The company have as yet made no decision as to starting their works, either in New Jersey or elsewhere. How soon, if at all, work will be resumed at Oxford is still a problem, in the decision of which the company will undoubtedly be largely influenced by the action of the Legislature and by the willingness or unwillingness of the puddlers to resume work on the company's conditions.

The Congdon Brake Shoe Company of Chicago are erecting as an addition to their foundry an iron building, 200 x 110 feet, which will contain a 12-ton open-hearth steel furnace and a 24-pot crucible steel furnace. It is expected that the plant will be in full operation by June 1, making general steel castings and materials for the Ross-Meehan shoes.

Richard Hecksher & Sons, proprietors of the Swede furnaces at Swedeland, Pa., state that they have no intention whatever of blowing out or banking either of their furnaces, as has been rumored.

The citizens of Pittsburgh, Texas, are raising a bonus for the purpose of securing a 50-ton blast furnace.

Joseph E. Thropp, owner of the Everett Furnace at Everett, Pa., announces that the stock of ore and coke at the furnace is being worked up preparatory to banking the stack for a few weeks, during which time some needed repairs will be made and probably the railroad on the property leading to the ore mines extended. While the furnace is banked work will be pushed, with an increased force, on the ore mines. Everett foundry iron enjoys a high reputation among the leading Northern irons in the market, being made entirely from all ore mixture. It recently stood a test of 26,000 pounds.

It is announced that the Norristown Iron Works furnace, operated under lease by Isaac McHorn & Sons, at Norristown, Pa., will continue in operation as long as their present supply of ore lasts, at the same rate of wages that are now being paid, and no reduction in wages will be made during the present blast. The furnace will be closed down in a short time for the purpose of making some needed repairs. After these have been made, and the furnace starts up, the question of a reduction of 10 per cent. in wages will be discussed.

The Pittsburgh Car Wheel Company of Pittsburgh, mention of whose organization we have made before, have been granted a charter with a capital stock of \$30,000. The directors are P. H. Griffin, P. G. Smith, J. H. Fleming and R. J. Mercur of Buffalo, N. Y., and C. L. Magee of Pittsburgh. The new concern will engage in the manufacture of car wheels in Pittsburgh, and work on the plant will be commenced in a short time.

The Bluffton Car Wheel Company at Bluffton, Ala., who recently commenced operations, have secured the contract for making the car wheels for the entire East Tennessee, Virginia and Georgia Railroad system and the first order for 500 wheels was received a few days ago.

A verdict of \$48,000 was rendered for the plaintiff at Youngstown, Ohio, last week in the case of Brown, Bonnell & Co., of that place against the Mahoning Gas Fuel Company as damages for breach of contract in failing to furnish natural gas for a certain length of time.

The Oil Well Supply Company of Pittsburgh have leased for a term of one year the plant of the Eagle Rolling Mill and Tube Works, situated in the West End, Pittsburgh, and formerly operated under lease by the Oliver Iron and Steel Company of that city. The plant contains 21 single puddling furnaces and three trains of bar rolls. Muck iron will be made for consumption in the manufacture of oil-well supplies by the Oil Well Supply Company. This concern also operate the Elba Iron Works, at Pittsburgh, turning out skelp iron for use in the manufacture of tubes.

Furnace F of Carnegie Brothers & Co., Limited, at Braddock, Pa., was blown out last week for repairs. It has been in blast a little over two years, and in that time has made 253,000 tons of Bessemer pig iron, which can be considered a creditable record. The above firm are now operating seven stacks on Bessemer and one on spiegel and are consuming all the pig iron they make. In addition to this they are the largest buyers of pig iron in the Pittsburgh district.

The Riverside Iron Works of Wheeling, W. Va., are erecting an addition to their shipping department for the purpose of increasing their shipping facilities, which have become inadequate, owing to their rapidly increasing business. All departments of the plant of this firm, with the single exception of their nail factory, are in full operation.

Fairchance Furnace of the Fairchance Furnace Company, at Fairchance, Pa., has been idle for the past 18 months, and will not be operated again by the present owners. In all probability it will be dismantled. The furnace is a small one, being 61 x 12½ feet in size, and made about 12,000 tons of iron per year. It was built in 1861.

A policy of retrenchment has been inaugurated at the Homestead Steel Works of Carnegie, Phipps & Co., Limited, at Homestead, Pa., and during the past few weeks a large number of men have been laid off.

On the night of the 14th inst. the plant of the Paige Tube Company at Warren, Ohio, was almost totally destroyed by an explosion of the boilers. Several men were killed and a number of others were badly injured. A meeting of the directors of the company was held in Warren on the 17th inst., and it was unanimously decided to rebuild the destroyed portion of the works. Operations will be pushed as fast as possible, as the firm have plenty of orders on hand to be filled as soon as possible.

The Aetna Iron and Steel Company of Bridgeport, Ohio, are giving employment at present to 950 men, and their aggregate wages amount to a sum slightly in excess of \$2000 per day.

The S. R. Smythe Company, engineers and contractors, Lewis Block, Pittsburgh, Pa., have just completed their third contract with the Pennsylvania Tube Works of Pittsburgh for the erection of fuel-gas producers. This is now one of the largest and most complete fuel-gas plants in the country, and is working in a very satisfactory manner, and so far, it is claimed, has cost nothing for repairs. This was the first fuel-gas plant erected in Pittsburgh to take the place of natural gas. The above firm have also remodeled the entire factory of the Howard Plate Glass Company at Cochran Station, Pa., for the use of artificial gas. The fuel-gas plant erected by this firm for the Lukens Iron and Steel Company at Coatesville, Pa., is also in successful operation and giving good results. Among contracts closed by this firm for this year are the following, which are for complete fuel-gas and furnace plants: Fallston Fire Clay Company, Fostoria Glass Company, Syracuse Tube Company, Phillips Glass Company, Millvale Iron Company, Pottsville Iron and Steel Company, Wormser Glass Company, Tyler Tube and Pipe Company, and they are already at work on the

contract which they have closed for the window glass factory at Jeannette, Pa., which consists of the entire remodeling to the use of artificial gas and extensive additions to same.

Rosena Furnace, at New Castle, Pa., is being operated under lease from the W. H. Brown estate, by the Oliver Iron and Steel Company, making mill iron for use in the Pittsburgh mills of that firm. The furnace has been in blast for about three and a half years, and has made in that time 191,000 gross tons of mill iron on one lining. The furnace has old-fashioned iron-pipe stoves, and makes about 1200 tons of iron per week. It was idle about 15 weeks in the early part of 1891, on account of the coke strike. There is now piled up at the furnace the largest stock of pig iron ever carried, and this amount is being added to by the stocking of all the iron now being made. The lease of the Oliver Iron and Steel Company on this furnace expires on June 1 next, and has not as yet been renewed. The furnace needs to be remodeled in order to compete with other furnaces and meet the present low prices of iron.

The Pennsylvania Zinc and Iron Company have been organized at Roanoke, Va., to manufacture iron and zinc, erect furnaces, &c. J. H. Bartlett is secretary and treasurer.

The Mary Lee Coal and Railway Company, Lewisburg, Ala., are contemplating the erection of an iron furnace. This company will also erect 190 new coke ovens.

The Dickens Car Wheel Company, at Houston, Texas, have increased their capital stock from \$50,000 to \$75,000, and will enlarge their plant.

The Messrs. Colby of Groton, N. Y., who have been connected with the Groton Bridge Company, have secured the lease of the old Southern Central Railroad shops at Owego, N. Y., and are now busily engaged in establishing a plant for the manufacture of iron bridges. The new works will be in full running order before May 1.

The puddling furnaces at the Burden Steam Mill, Troy, N. Y., were lighted Sunday night, after being idle ten days for repairs.

The Belgian train at the Albany Iron Works, Troy, N. Y., was idle last week for the first time during the winter. It was started last Thursday again.

The sheet and plate mills of the Mahoning Valley Iron Company at Youngstown, Ohio, which have been idle for about three months, resumed operations last week.

The rolling mill at Harriman, Tenn., is now shipping 50 tons of bar and round iron daily to Louisville, Cincinnati and other cities. The demand for Harriman bar iron is increasing, and this company are enjoying a gradual and steady enlargement of their business.

Furnace No. 2 of the Tennessee Coal, Iron and Railroad Company's Ensley City plant, which is now undergoing repairs, went out of blast January 31, 1892. During that time it made 119,926 tons of iron on one lining.

Queen City, Texas, has closed a contract for the erection of a charcoal iron furnace. It is to be 50 tons capacity, and will be completed within 18 months. The Queen City Iron Works, which were destroyed by fire last November, have been rebuilt, and will soon be in full blast again.

On March 15 the Llano Improvement and Furnace Company held their annual stockholders' meeting at Llano, Texas. The directors were instructed to advertise for bids for the erection of an iron furnace and steel plant.

Last week there was turned out at the American iron and steel works of Jones & Laughlin, Limited, at Pittsburgh, 5500 tons of Bessemer steel billets, the best record for one day being 1037 tons. The billet mill of this firm is without question one of the best in the country when capacity and cheap production are considered.

Machinery.

The Campbell & Zell Company announce that they have secured the entire plant known as the Ramsey Engineering Works, located at Locust Point, Baltimore, where they will manufacture marine or stationary engines and boilers, tanks and stand pipes. They have facilities also for making repairs for ships, and with these increased facilities, operating in conjunction with their Enterprise Iron Works of Canton, they are enabled to meet the increasing demand for the Zell water-tube boiler and the Olsen feed-water heater and purifier.

A. J. Kirkwood & Co. of Chicago, Ill., announce that they have turned over to Hill, Clarke & Co. of Boston the business heretofore carried on at 12 and 14 South Canal street, Chicago. Hill, Clarke & Co. will continue the business as their Chicago branch, adding to the line of wood and iron working machinery heretofore carried metal-working

machine tools. Charles A. Clarke of the Boston firm will become resident manager of the Chicago branch.

The Sebastian-May Company, manufacturers of lathes, drill presses, shapers and machinists' supplies, at Sidney, Ohio, announce that the interest and good will of all the members of the firm, except Mr. May, have been bought by A. P. Wagner, secretary, and that they now have the capital and facilities to largely increase their business and fill all orders promptly.

George V. Cresson, Philadelphia Shafting Works, has opened a branch office in New York, at the Electrical Exchange Building, 136 Liberty street, Room 214. We learn that business with them is very good at present, numerous orders for shafting and power-transmitting machinery are being executed, both for Government and for private parties. And there is prospect of plenty of work for the next few months, although, as is almost universally the case, payments for completed contracts are coming in slowly.

Moore, White & Co., Fifteenth street and Lehigh avenue, Philadelphia, report business as active, and prospects as regards paper-making machinery never better, mills being mostly in full work, and orders coming in regularly, consequently the outlook in this respect is promising.

The South Bend Boiler Works, at South Bend, Ind., have been burned to the ground. The loss is \$15,000.

The Warden Mfg. Company of Philadelphia have some heavy work on hand in the construction of locomotive and marine boilers. They are confining themselves at present almost entirely to boiler making, and are executing contracts for 75 of from 35 to 300 horsepower, while they anticipate orders for 50 more in the course of a few days. Forty-eight are complete and ready for shipment for the New York cable roads as soon as the buildings for their reception are ready, and the remainder are well forward.

The company's contracts include orders for about 7000 horsepower for the Third Avenue Cable Road, New York City; 6000 horsepower for the Broadway Cable Road, and 10,000 for various other parties. The boilers for cable roads are of 18 x 72 feet dimension. They are also engaged on three marine boilers for the United States twin screw steamer Maple, which is now building at Samuel Moore & Son's yard, destined for service on the coast as lighthouse tender; two being of 23 tons weight each, 12 x 12 feet, and the third a small vertical boiler for auxiliary use. Among the smaller work may be mentioned a 25-ton ladle for the Midvale Steel Company of Philadelphia, one of the largest ladles yet manufactured.

The report has been freely circulated that the Rome, Watertown and Ogdensburg Railroad Company will remove their shops from Oswego, N. Y., to Buffalo.

Bement, Miles Co. of Philadelphia are busy in heavy machine work, but business in light machinery is somewhat slack. The most important machine now on hand in their works is a large wall planer for planing frames and cylinders of marine engines, which is in course of construction for the Newport News Dry Dock and Shipbuilding Company.

It is built on a new design, and is an adaptation of and improvement on the previous machines of the kind, being probably unique as to size, 27 feet in height and 25 feet width, with a total weight, including platform, of 60 tons. They are also engaged on a 120-inch iron planer, of their own pattern, for the Pennsylvania Iron Works, while another is in hand for McIntosh, Seymour & Co. of Auburn, N. Y. Another heavy piece of work now being constructed by this company is a 90-inch lathe for boring 14-inch guns, ordered for the United States Navy Yard, Washington, D. C., the body of which is no less than 115 feet in length, built in three sections. Bement, Miles & Co. are at present employing some 500 hands, and are encouraging prospects of business for the future as encouraging on the whole.

The American Fire Engine Company of Seneca Falls, N. Y., recently established, are doing a very large business.

A part of the James Delamater Building at Fort Plain, N. Y., is being prepared for the Ward-Ayres Axle Box Foundry.

The Conners Mfg. Company have been organized at Columbus, Ohio, with a capital stock of \$25,000. The new concern will occupy the old Stevenson foundry, and will engage in the manufacture of engines and boilers and other mechanical appliances.

Cox & Sons Company of Bridgeton, N. J., are erecting a threes-story brick addition to their machine works.

The Murray & Stevenson foundry at Aniston, Ala., is now in full operation under the name of Noble Brothers Company, the recent purchasers.

Although the Pennsylvania Machine Company, 31 North Seventh street, Philadelphia, have shared the common experience of almost all kindred firms in feeling the effects of the general depressed condition of business, trade having been unusually slack with them for the past few months, buyers holding off and orders scarce, they are now able to report a decided improvement since the first of the month, numerous orders for machinery having been received by them from both East and West. Notwithstanding the fact that the margin of profit is not yet all that could be wished for, there are indications which encourage them to hope for a steady flow of business, and they are sanguine of better times than they have experienced for some months. The company have recently secured the Eastern agency for the Coates Oil Burner, manufactured at Terre Haute, Ind., burning crude oil. The burner has been already supplied to several of the largest manufacturers in the country, including the Baldwin Locomotive Works, Pennsylvania Steel Company, &c., and is reported as achieving satisfactory results. The makers claim that there is no clogging, and that they are suitable and recommended for rolling mills, forges, steam boilers, lime kilns, &c., and are likely to attain widespread adoption with liquid fuel. The Pennsylvania Machine Company have lately disposed of a number of Muller lathes and Cincinnati milling machines, both manufactured in Cincinnati, for which they are sole agents in Philadelphia.

The Middlesborough South Boston Iron Works, Middlesborough, Ky., are asking for bids for the erection of their buildings, which are to cost about \$150,000. The work of removing the machinery from the Boston works will begin very shortly. The value of the machinery to be removed is estimated at \$600,000 to \$700,000, and the freights alone will amount to \$20,000. It is expected that this plant will be in operation by September. When running full it will employ 500 men.

R. D. Johnson and associates have incorporated the Birmingham Bolt and Nut Company at Birmingham, Ala., to manufacture bolts and nuts. They will erect a factory at once.

The Louisville and Nashville Railroad Company are preparing to erect a foundry and machine shop at Long Beach, Miss.

William Tod & Co., founders and engine builders, of Youngstown, Ohio, recently made a shipment of engines to the new tin-plate plant now being erected by the American Tin Plate Company at Elwood, Ind.

The Lloyd Booth Company of Youngstown, Ohio, last week, shipped to the Indiana Iron Company at Muncie, Ind., a 16-inch roll train. They have recently received an order for 22-inch sheet train from the Corning Steel Company of Chicago, who are erecting a plant at Hammond, Ind., for the manufacture of steel sheets and light plates. They had previously received from this firm a contract for the erection of three trains of rolls. The same firm recently made a large shipment of machinery to the new tin-plate plant of the American Tin Plate Company at Elwood, Ind.

At a meeting of the Board of Directors of the Westinghouse Air-Brake Company of Pittsburgh, held in that city on the 18th inst., a dividend of 5 per cent. was declared payable to stockholders of record April 9.

The Excelsior Casting Company have been organized at Alliance, Ohio, with a capital stock of \$10,000. The new concern will engage in the manufacture of brass and bronze castings, plows and radiators. The incorporators are: J. H. Tressei, Edwin C. Will, W. H. Whitacre, M. L. and B. H. Rinehart and L. W. Smith.

The Phoenix Iron Company of Trenton, N. J., who have a number of Government contracts for the erection of lighthouses, have gone into the hands of a receiver. Wilson D. Havens, president of the company, made the application, and the Vice-Chancellor appointed Joseph Stokes, the superintendent of the company, as receiver. Mr. Havens is the largest stockholder, and in his petition he sets forth that the liabilities of the company amount to \$136,783, while the resources, outside of the real estate and machinery, are only \$26,987. The real estate, he alleges, is valued at \$95,000 and the machinery at \$62,646, but the whole would not now bring over \$75,000. There are mortgages upon them amounting to \$87,000. The debts of the firm consist of bills payable to the amount of \$16,776, accounts unsettled, \$32,506, along with interest and mortgages amounting to \$86,000. The resources are principally bills receivable to the amount of \$14,539, stock on hand worth \$8390, and book accounts, \$4000. The stockholders of the company are W. D. Havens, \$99,500; Frank Schumann, \$10,000; H. J. Baker, \$10,000; R. H. Moore, \$5000, and John S. Murphy, \$500.

Hardware.

New Castle Wire Nail Company, New Castle, Pa., are erecting a new machine shop, and as soon as it is in readiness they will complete the 40 new nail machines which are now in course of construction. The addition of these machines will largely increase the company's production and make the plant, we are advised, as complete as any in the country.

Wilcox, Crittenden & Co., ship hardware manufacturers, Middletown, Conn., have recently put into their factory a new 50 horsepower Fitchburg engine and a Hazelton boiler. For the past quarter of a century this concern has been dependent on water power to drive their machinery, but increased business demanded a change, and steam power was decided on to use in connection with the water power, thus giving enlarged facilities.

A company is about to be organized at Auburn, N. Y., with \$40,000 capital, to manufacture the Chicago planes (Phelps' patent). These planes were patented in the United States and Great Britain February 9, 1892.

Wright & Colton Wire Cloth Company, Worcester, Mass., who have been manufacturing their new process reverse twist netting for about six months, advise us that they have run their factory night and day, with two gangs of help, for the past four or five months, and will be obliged to do so for the next two or three months in order to supply the increasing demand for the netting. There are several features which it is claimed are peculiar to this netting; among others that it will roll out and lie flat and smooth without being crooked and baggy, and that it has from 50 to 100 per cent more rigidity or stiffness than other wire. The company are building and perfecting new improved machinery to manufacture this particular kind of goods and are increasing their output.

The Rome Mfg. Company, to manufacture and sell tea-kettles, boilers, &c., in Rome, N. Y., have been incorporated, with a capital of \$15,000. The directors are: Franklin A. Ethridge, William K. Huntington, Wiley L. Kingsley, John G. Bessill, James Stevens, Walter B. Johnson, Jonathan S. Hasleton, all of Rome.

Yeegurtha, Hoyt & Co.'s foundry and machine shop at Walton, N. Y., was recently burned. Much valuable machinery was entirely destroyed, but the pattern rooms and office were luckily saved. The loss is estimated at about \$7000; insurance, \$4300. The firm made arrangements the day following the fire and continued business. They will rebuild immediately.

The Roll Paper Cutter Company, late of Richford, and formerly of Groton, N. Y., will remove their works to Oswego, N. Y. Last week a stock company was formed at the latter place, with a capital of \$50,000, and including J. C. Dwells, J. Forsythe and H. C. White of Oswego as stockholders, besides the original members, J. W. Allen and Duncan McLachlan. There has been an increased demand for roll paper cutters, which induced the company to look for more capital and better facilities. Mr. McLachlan will be president and business manager and J. W. Allen treasurer of the new concern.

Roy's butt factory at Fort Schuyler, near West Troy, N. Y., has been closed for an indefinite period. Over 100 men are thus thrown out of employment. The factory had been in operation many years, and its suspension is a large loss to the village.

The Clipper Chilled Plow Company of Elmira, N. Y., have sold a third interest to J. C. Green of Williamsport, Pa. The new partner is one of that city's most influential business men. The company's intention is to increase their facilities in accordance with their increasing business. The firm is now composed of Messrs. Weeks and Green, the latter residing at Williamsport. The plant employs about 50 men and, it is expected, they will employ 100 as soon as reorganization is perfected.

The Akron Tool Company, Akron, Ohio, announce the following agencies for the sale of their Akron tubular steel barrows: Dodge, Haley & Co., Boston, Mass., New England agents; W. Dodman, 103 Chambers street, New York; Riehlé Bros. Testing Machine Company, Philadelphia; R. L. North, Jr., 154 Lake street, Chicago, and Chas. L. Pierce & Co., San Francisco, Cal.

Haight & Clark, Albany, N. Y., are calling attention to their excellent facilities for making all kinds of iron castings, as well as brass, bronze and aluminum bronze castings from patterns furnished them. If necessary they can also make the patterns. When desired, drilling, lathe work and finishing is done. They state that they use only new metal of the best quality, thus insuring soft, strong and smooth castings, easily drilled and worked. Nickel, 1 pounds of steam, which will be generated

brass and bronze plating and japanning are also executed.

Belden Machine Company, New Haven, Conn., advise us that their business shows a very satisfactory increase, with a bright prospect for the future. They allude especially to the reputation gained by their improved upright power hammer, which they have made a specialty in the machinery line. Most of their hardware specialties are new goods, and have naturally required some little time to introduce. The trade in them has, however, so much increased that the company have been compelled to enlarge their facilities to keep up with orders.

Burton Block, Chicago, Again Burned.

The old Burton Block, now the Phoenix, at Van Buren and Clinton streets, Chicago, which has burned down twice before and which has each time furnished a fatality, was again wrecked by fire on the 19th inst. and came near once more scoring a death. As it was, a policeman was dangerously hurt and a fireman slightly bruised. The blaze caused a loss of perhaps \$90,000. The fire broke out shortly before 5.30 o'clock, and spread through the six-story structure with such rapidity that it necessitated a general alarm, calling out 15 engines.

The burned building was well named the Phoenix. It was formerly known as the Burton Block, having been built by John E. Burton, the so-called Iron King of the Gogebic, but after its repeated destructions it was christened the Phoenix. The last time it burned two persons were crushed to death under a falling wall. In the neighborhood the structure was nicknamed the "hoodoo." The building runs back to Jackson street, but the north half is uninjured owing to the stanchness of a fire or division wall.

On the first floor was located the Dawson Pulley Mfg. Company, whose stock consisted mostly of tools and machinery. Among the losses sustained by this company were the destruction of two \$3000 lathes and other valuable machinery. The Garden City Wire and Spring Company lost \$3000. The Buckwalter Stove Company had \$800 worth of stoves stored in the basement, upon which there was \$500 insurance.

Launch of the El Sud.

On Wednesday of last week the El Sud, an iron freight steamer of 4500 tons register, was launched from the yards of the Newport News Shipbuilding and Dry Dock Company. The following are the general dimensions:

	Feet.
Length between stem and after side of propeller post.....	380
Breadth of beam, molded.....	48
Depth from top of keel to top of upper deck beams of lowest part of sheer....	33.9
Length over all.....	406

She has three decks and a partial orlop deck at fore end of fore hold. On the awning deck are iron houses. She will be rigged with four iron-pole masts and the necessary booms for handling cargo, together with steam hoisting engines located at the different hatches, to work in connection with them. Freight hatches and ports are located so as to handle cargo expeditiously.

The vessel is to be steered by steam from the forward pilot house, or by screw hand gear from the after house.

A steam windlass and steam capstans are provided for handling anchor, hawsers, &c., as well as a steel rope with drum aft for towing.

She will be propelled by a vertical triple-expansion engine with three cranks, placed at angles of 120°. The cylinders are 32, 52 and 84 inches diameter by 54 inches stroke of piston, working under 167

in three double-ended cylindrical steam boilers with three corrugated furnaces at each end. There will be two fire rooms and one smoke stack.

The Laughlin Nail Company of Wheeling write us as follows: "On page 515 *The Iron Age*, March 17, appears an item referring to our company, which does us injustice and is false in every particular. You state that the Laughlin Nail Company of Wheeling, W. Va., whose factory is located at Martin's Ferry, Ohio, have closed down for an indefinite period. As a matter of fact, our factories, which are the largest Bessemer steel cut nail factories in the world, have been in constant operation for upward of two years, and we have no idea whatever of closing down either temporarily or permanently."

For some time past experimenting has been going on at the Homestead Steel Works of Carnegie, Phipps & Co., Limited, at Homestead, Pa., with a view of cheapening the cost of open-hearth steel. As is well known, the common practice is to charge the open-hearth furnaces with pig iron in bars, but at the above works a considerable saving in time has been effected by melting the pig iron in the cupola first and then charging the molten metal into the open-hearth furnaces. This process is not new, by any means, and was tried many years ago, but in a somewhat different manner from that pursued at Homestead. At present the new method has not been thoroughly tried, but is only in an experimental stage. The steel turned out by the new method is not superior to that made in the usual way, but it is believed that a considerable saving in time required to make a heat can be effected. The published statements that the new process will work a revolution in the steel industry, and will effect a saving of fully one-half in labor, are pronounced untrue by the firm in question.

Upon the recommendation of Commander Chadwick, who was detailed by Secretary Tracy as an inspector of the construction of the war steamer Maine, the rig of that vessel has been altered so as to leave the vessel something of an anomaly among ships of war. Her regulation masts are to be removed and will be replaced by two military masts, leaving her without sail power, and the object of criticism by those who believe that no ship should venture from the shore depending alone upon her engines for motive power.

The London *Daily Graphic* contains a description of an electrical device for carrying a line to a vessel, made on a plan similar to the Sims Edison torpedo and containing two small electric motors, one to work the propelling screw and the other the steering apparatus. In the center of the float is a cable which would be dropped as the float proceeds. At the head there is a chamber containing a rocket to be fired when the float reaches the vessel, carrying a manila line over the boat. The position of the float is indicated by a red and green electric light, so that those on shore can govern its actions.

The offices of Chess Brothers, manufacturers of Tack and Nail Plate, Tacks, &c., and also of the Central Expanded Metal Company, manufacturers of Expanded Metal Lathing and Fencing, have been removed from 116 Water street, Pittsburgh, Pa., to the Standard Building, 531 and 533 Wood street, in that city. The shipping heretofore done at 116 Water street will be done from the factories located on the south side of Pittsburgh, Pa., and at Rankin, Pa.

TRADE REPORT.

The first signs of encouragement are beginning to appear from different sections of the country, and the news from the leading markets is not so unanimously unfavorable as it has been during the past month. It looks as though the steady decline has been finally checked. Philadelphia reports a steadier market in Pig Iron and in Billets. Chicago notes as a better sign a growing demand for finished material. Bessemer Pig at Pittsburgh is holding its own at \$14.50, and no further advices of exceptionally low prices in Southern Iron have come to hand from the principal distributing centers.

A heavy business has been done in Pittsburgh in Billets, Wheeling and Pittsburgh sharing in one order for 20,000 tons, all year delivery, at \$23.37 $\frac{1}{2}$.

Altogether, during the past six weeks, very large sales of steel have been made in the East and in the West at low prices, the rolling mills having bought in larger quantities and for a longer time than is usual.

In the Rail trade the Eastern business has been confined to one lot of 10,000 tons. In the West the Manitoba road is in the market, but the Eastern mills cannot reach the head of Lake Superior as cheaply as the Chicago mills, and are not likely to participate in the business.

The first sale of any consequence in Old Iron Rails is reported from Pittsburgh, involving close to 1,000 tons at \$21.62 $\frac{1}{2}$, delivered in the Mahoning Valley.

Interest in the metal market still centers in Copper which has been advanced by concerted manipulation on both sides of the Atlantic. Our cable reports a sale of 7000 tons of Anaconda Matte on the basis of a sliding scale. Some speculative maneuvering is going on in Tin. Some negotiations are going on between Western smelters and the Lead Trust, an appraisal of some of the plants being now under way.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St.,
PHILADELPHIA, Pa., March 22, 1892.

The general tone of the market during the past few days has been of a more settled character than for some time past. As a rule prices are steadier, possibly a shade firmer, but they cannot be called higher. There is a distinctly better feeling, however, and sellers appear to have reached a point below which they will not go. Consequently there has been a heavier business, those having options at low figures hastening to close them, sellers intimating that they would leave nothing open beyond dates previously specified. Taking everything into account, therefore, it may be said that the past two weeks have seen the largest transactions since the commencement of the year. Some of these were forced sales on special terms, but a large amount was taken at ordinary prices, so that it begins to look as though business was assuming its normal condition. It is very true that things are bad enough yet, but it is equally true that this is the first time during the current year in which it can be asserted that there

is nothing weaker than it was the week previous, while quite a number of articles are firmer, and in some cases more money is asked. It looks as though the turn may have come, but caution is so prominent a feature these days, that nothing is taken for granted and what every one wants to see before talking better prices is more business.

Pig Iron.—Market somewhat stronger during the past few days. As already mentioned, options have very generally been taken up, and on new business holders are trying to get a little more money. That is to say, holders who were more or less frightened, and who under semi panic influences offered their Iron at prices in proportion, are now trying to get back a part of the decline. Whether this can be done or not remains to be seen, but in any case there is plenty of Iron at low prices, perhaps not the particular brand that the buyer might prefer, but there are substitutes, and if one Iron cannot be had at a price to suit, another can, so that so far as quotations are concerned, they are probably at as low a point as ever. Nevertheless, the feeling is steadier, and while there is but little chance for any decided change in the condition of the market, it is the general opinion that current quotations are perfectly safe, so far as the buyer is concerned. The main point with buyers, however, is to get their own particular brand, which, being in good demand, is not always available at the comparatively low figures quoted for other Irons. This leads to an extraordinarily wide range of prices, as will be seen from quotations given herewith. For Harrisburg and south of that point an allowance of 50¢ or more per ton is conceded on Alabama and other Southern Irons, but for seaboard and equivalent points prices are about as follows:

	Iron.	Steel.
Tank Plates.....	1.80 @ 1.90 $\frac{1}{2}$	1.85 @ 1.95 $\frac{1}{2}$
Shell.....		2.15 @ 2.20 $\frac{1}{2}$
Flange.....	2.70 @ 2.90 $\frac{1}{2}$	2.40 @ 2.50 $\frac{1}{2}$
Fire-Box	3.00 @ 4.00 $\frac{1}{2}$	2.70 @ 3.20 $\frac{1}{2}$

Structural Material.—A fair degree of activity is reported in this department, with prospects of a still heavier demand in the near future. At present the lots called for are mostly small, and for quick delivery, but inquiries are being made which indicate a good deal of work under consideration. The Reading terminal in Philadelphia, for instance, and the New York Central in Buffalo, will each require probably a couple of thousand tons each, while in Chicago a very large amount of material will be necessary both for elevated roads, terminals, World's Fair buildings, &c. Prices are steady at about last week's quotations: From 1.85 $\frac{1}{2}$ to 2¢, delivered, for Bridge Plates; 1.9¢ @ 2¢ for Angles, and 2.25¢ @ 2.40¢ for Beams, Channels or Tees.

Sheet Iron.—Business is about as good as can be expected, considering the season and the generally depressed condition of the Iron industries. Mills are kept fairly well employed, however, and prices for best makes are well maintained at about the following prices, viz :

Best Refined, Nos. 14 to 20.....	2.20¢ @ 2.40¢
Best Refined, Nos. 21 to 24.....	@ 3.10¢
Best Refined, Nos. 25 to 26.....	3.20¢ @ 3.25¢
Best Refined, No. 27.....	3.40¢ @
Best Refined, No. 28.....	3.50¢ @

Common, $\frac{1}{4}$ ¢ less than the above.

Quotations given as follows are for the best Open-Hearth Steel, ordinary Bessemer being about $\frac{1}{4}$ ¢ lower than are here named:

Best Soft Steel, Nos. 14 to 20	3¢ @ 3½¢
Best Soft Steel, Nos. 21 to 24.....	3½¢ @
Best Soft Steel, Nos. 25 to 26.....	3¾¢ @
Best Soft Steel, Nos. 27 to 28.....	4¢ @

Best Bloom Sheets, $\frac{1}{4}$ ¢ extra over the above prices.

Best Bloom, Galvanized, discount... @ 67½ %

Common, discount... @ 70 %

Old Material.—There is a limited amount of business at quoted rates, but beyond that very liberal concessions would have to be made to realize on large lots. The usual asking prices are about as follows: Iron Rails, \$20 @ \$21 asked, spot, or according to location delivered; Steel Rails, \$16 @ \$17, delivered; No. 1 Railroad Scrap, \$19.50 @ \$20, Philadelphia, or for deliveries at mills in the interior \$20 @ \$21, according to distance and quality; \$14.50 @ \$15 for No. 2 Light; \$14 @ \$14.50 for best Machinery Scrap; \$13 @ \$13.50 for ordinary; \$14 @ \$15 for Wrought Turnings; \$9 @ \$10 for Cast Ironings, and nominally \$22 @ \$24 for Old Fish Plates, and \$16 @ \$16.50, delivered, for Old Car Wheels.

Muck Bars.—There is a full supply of first-class Bars at \$25 @ \$25.25, delivered, but buyers respond very slowly. It is not unlikely that lower figures would be accepted for good-sized lots on firm offers, but consumers appear to be well supplied, and are, therefore, quite indifferent about increasing their lines.

Chicago.

(By Telegraph.)

Office of *The Iron Age*, 59 Dearborn street, Chicago, March 23, 1892.

The market has been decidedly irregular the past week, and reports are current of transactions in many lines at extremely low figures. If these figures were printed they would indicate to consumers that sellers were hopelessly demoralized. There is some reason to believe, however, that the depth of the depression has been reached, as efforts have been made to duplicate some of these purchases without success. Those who are anxiously looking for an improvement in the tone of business may not yet be able to see it, but there are now some rather encouraging circumstances to be noted. Among these is the increased activity on finished products. Mills are certainly better supplied with work than they have been. As spring advances there is every reason to hope and believe that trade will rapidly increase in volume.

Pig Iron.—No general improvement in the demand is visible. Several large contracts have been closed in the past few days, but some of them were pending for considerable time and others are the result of very low offers made by furnace companies. Local Coke, it is claimed, can no longer be had at the extreme prices known to have been made on a few large blocks. Production is being so greatly curtailed that the market is getting under better control. There are only four furnaces now making Foundry Iron in this district, and within a fortnight one of these will probably be blown out. Southern Coke may continue to be a disturbing element, but only on the lower grades, such as No. 2 Soft and Gray Forge. It is difficult to make a quotation on these, as every transaction appears to be of its own kind. Southern makers not represented here should not be misled by our quotations, as they represent the asking price, while a cut of 50¢ @ 75¢ may be made to effect a sale. Lake Superior Charcoal is very quiet. Prices are unchanged, as manufacturers say that even a heavy cut would not create a legitimate demand at this time. Consumers are taking in Iron very satisfactorily on old contracts. Quotations as follows:

Lake Superior Charcoal.....	\$17.00 @ \$17.50
Local Coke Foundry, No. 1.....	15.00 @ 15.50
Local Coke Foundry, No. 2.....	14.00 @ 14.50
Local Coke Foundry, No. 3.....	13.50 @ 14.00
Local Scotch.....	15.50 @ 16.00
Ohio Strong Softeners.....	17.25 @ 17.75
Southern Coke, No. 1.....	15.50 @ 15.75
Southern Coke, No. 2.....	14.50 @ 14.75
Southern Coke, No. 3.....	13.75 @ 14.00
Southern, No. 1, Soft.....	14.50 @ 14.75
Southern, No. 2, Soft.....	13.75 @ 14.00
Southern Gray Forge.....	13.25 @ 13.50
Southern Mottled.....	13.00 @ 13.50
Tennessee Charcoal, No. 1.....	17.50 @ 18.00
Alabama Car Wheel.....	21.00 @ 23.00
Coke Bessemer.....	16.50 @ 17.00
Hocking Valley, No. 1.....	17.25 @ 18.50
Jackson County Silver.....	17.50 @ 18.00

Spiegel.—Spiegel is firm at \$28 for 20%, but only a light trade is doing.

Bar Iron.—The carload demand is fair, but heavy business is disappointing; car builders here are not buying and other manufacturing consumers seem well supplied. A peculiar feature of the situation is the comparatively good demand for small sizes, while heavy Bars are neglected. Mill shipments are quoted at 1.60¢ @ 1.65¢, half extras, Chicago. Jobbers are not so firm, but make concessions—1.80¢ @ 1.90¢ from stock. Soft Steel Bars are still quoted 1.75¢ @ 1.85¢ from mill and 1.90¢ @ 2¢ from stock.

Structural Shapes.—Orders for bridge work have been placed to the extent of some hundreds of tons, on which the competition was very sharp. In one case a flat price of 1.92¢, delivered, was made on Iron Angles, Universal Plates

and Sheared Plates. Building contracts are slow to come to a point, but quite a good business is being done in small lots of Beams for repair work. Mill shipments are quoted at 2.25¢ @ 2.50¢ for Beams and Channels, 1.90¢ @ 2¢ for Angles, 2.50¢ for Tees, 1.90¢ @ 2¢ for Universal Plates and 1.95¢ @ 2¢ for Sheared Plates, Chicago delivery.

Plates, Tubes, &c.—The Plate trade has again been fairly active, but orders are still going to the dealers who are carrying stocks here. While mills generally are hungry for work there are now some notable exceptions, a few being reported as having filled up rapidly within the past two weeks. Boiler Tubes are in wretched shape, 70% off being quoted on 3-inch and upward.

Sheets.—Good inquiries are reported for Black Sheets, which are now in better demand than Galvanized. On No. 27 Common 2.90¢ @ 2.95¢ are the prices of good grades. Mill shipments of Galvanized are quoted 70% off, but the market is not firm. The outlook for Galvanized is improving as the season advances. Jobbers quote 3.10¢ for No. 27 Common Black and 67½% off for Juniata from stock.

Merchant Steel.—Although Open-Hearth Spring Steel is as cheap as ever, there is now some trouble in finding a manufacturer prepared to take contracts. All seem well supplied with work. The demand for cheap Steel and also for Tool Steel is large for the season. Specifications on contracts are going forward very promptly. Tire and Open-Hearth Machinery and Spring Steel are still quoted 2¢ @ 2.25¢ in carload lots, according to quality and finish, and ordinary Tool Steel 6¢ and upward.

Track Supplies.—The Steel Rail market is quiet, but without change in price. Persistent efforts have been made by some buyers to shade the established rate here, but without success. Quotations range from \$31.50 upward, according to the character of the order. All the mills of the Illinois Steel Company are now in operation again, the North Chicago Works having started up on Beams. Splice Bars are unchanged at 1.80¢ for Iron and Steel. Spikes are quoted 2.15¢ @ 2.20¢ and Hexagon Nut Track Bolts 2.65¢ @ 2.75¢.

Old Rails and Wheels.—The market price on Old Iron Rails has again declined. They are now available at about \$19, but there are no buyers. The railroads, however, are not pushing sales, as they are not so much in need of cash as they were some months back. Old Steel Rails are nominally worth \$13.50 @ \$14 for short pieces and \$14 @ \$14.50 for long lengths. Old Car Wheels are quoted at \$15.50 @ \$16, according to quantity, but are slow of sale.

Scrap.—The market is much weaker; under pressure to sell dealers are unloading their stock of Wrought. The bid of \$17.75 reported last week for Railroad Wrought hardly reflected the true condition of affairs, as the Scrap in question was traded for new material and the cash offer cut no figure. Other transactions were made at the same time at lower rates. Dealers quote selling prices per net ton as follows: No. 1 Railroad, \$17; No. 1 Forge, \$16; No. 1 Mill, \$11; Pipes, \$11; Cast Borings, \$7 @ \$7.25; Wrought Turnings, \$9.50 @ \$9.75; Axle Turnings, \$12; Heavy Cast, \$11.50; Store Plate, \$9; Malleable Cast, \$10; Mixed Steel, gross ton, \$10.50 @ \$11; Coil Steel, \$15; Leaf Steel, \$16.

Metals.—The Copper market has been hard to keep track of the past week. Consumers have been excited, as many of them were caught with small stocks when the advance came. Carload lots of Lake

have sold up to 12.50¢, and casting Copper up to 12¢, for spot cash. Merchants are loth to quote now, as further advances are looked for. Spelter is standing at 4.40¢, but good purchasers can do better. Export sales have relieved some of the producers in Missouri. Pig Lead has been steady. Some 700 tons have changed hands. Opening at 4¢, values have declined to 3.95¢, with little or no demand at the close. Dealers report consumers apathetic, and offerings for future delivery will not tempt them.

David L. Morgan has opened an office in Room 615, Northern Office Building, corner Lake and La Salle streets, Chicago, representing the Youngstown Iron and Steel Company, Linden Steel Company, Anderson Bolt Works, New Philadelphia Iron and Steel Company, and Nes Chain Works. His agencies, it will be seen, cover the field pretty thoroughly in Merchant Iron and Steel, and should recommend him to the favor of Western buyers, among whom he already enjoys an extensive acquaintance.

A. W. Dreves, 223 Phenix Building, Chicago, has been appointed agent for the Pittsburgh Steel Casting Company, pioneers in the manufacture of Steel Castings in this country. They make both Crucible and Bessemer Steel Castings of any size and pattern, from 1 lb to 20,000 lb, or heavier, if needed.

Howe, Brown & Co., Limited, announce that their business has outgrown the warehouse at 228 Lake street, Chicago, and they have therefore arranged for a building to be erected on Jefferson street, near Lake, which will be 60 x 150 feet in size. The lot in question was selected because of its accessibility from all sections of activity, and because it is so located in the block that four delivery doors can be arranged in it. The firm acknowledge their obligations to their customers who have so generously patronized them, and ask for suggestions regarding salable sizes to be added to their special Tool-Steel stock, as shown by the last stock sheet issued.

Detroit.

WILLIAM F. JARVIS & Co. of Detroit, Mich., report under date of March 21, 1892: The dullness and listlessness of the Iron market was still further demonstrated and emphasized during the week under review. There were scarcely any transactions of note in Foundry Iron, although this market was actively canvassed by agents for the various Southern furnaces. The buyers, it was thought, fully appreciated the fact that the market was as low now as it could possibly be, and while some took advantage of the low prices by buying for long future deliveries, there are others who believe that there will be a still further reduction; at least, that there can be no advance with stocks piling up as they are at the present time. Reports, however, from various parts of the country of the curtailment of production by the blowing out of so many furnaces would seem to indicate that they were wrong in this particular.

Buyers of Lake Superior Charcoal Iron are beginning to inquire for their season's supply for delivery after the opening of navigation. There have been some orders booked at market figures for this delivery, although there is less buying at the present time than in previous years.

With no change in the market, we list prices as follows:

Lake Superior Charcoal, all numbers.....	\$17.00 @ \$18.00
Lake Superior Coke, Bessemer.....	16.50 @ 17.00
Lake Superior Coke Foundry, all ore.....	17.00 @ 18.00
Ohio Blackband (40 per cent).....	17.50 @ 18.00
Southern No. 2.....	15.25 @ 15.50
Southern Gray Forge.....	13.50 @ 14.00
Jackson County (Ohio) Silver.....	18.00 @ 18.00

Pittsburgh.

Office of *The Iron Age*, Hamilton Building, Pittsburgh, March 22, 1892.

The week under review has been without any special features, and the volume of transactions was only moderately large. Soft Steel led in this respect, and several transactions were closed last week involving large amounts, while some others will probably be closed this week. In some quarters the belief is expressed that a better feeling will soon prevail, although any decided advance in prices is not expected for some time yet.

Pig Iron.—The market for the past week has been featureless and transactions were confined entirely to small lots. Prices have not shown any further decline, and, on the whole, the situation is about the same as that reported one week ago. Well-informed authorities state that we cannot look for an improved condition of the Pig-Iron market until there has been a material reduction in the large stocks now on hand. If the shut-down movement, concerning which so much has been said, does not assume larger proportions in the near future the hopes held out for a material reduction in output will not be realized to any great extent. Indications now point to a very large increase in the demand for Bessemer Iron and a corresponding decrease in the consumption of Mill Iron. This will be caused by the additional uses to which Soft Steel is being put, particularly in the manufacture of Pipes and Tubes. In the present depressed condition of the Iron market we have had one good feature in connection with it, and that has been the favorable condition of the money market. Had we been confronted with a tight money market and more than ordinary difficulty in securing loans from the banks it seems certain that a number of concerns would have been crowded to the wall. Altogether the situation could be worse, although it is certainly bad enough. As we state above, prices are about the same, and Bessemer seems to have settled down to \$14.50 for close delivery. We quote as follows:

Neutral Gray Forge.....	\$12.75 @ \$13.00, cash
White and Mottled.....	12.50 @ 13.00, "
All-Ore Mill.....	13.75 @ 14.25, "
No. 1 Foundry.....	14.75 @ 15.00, "
No. 2 Foundry.....	14.10 @ 14.50, "
No. 3 Foundry.....	13.75 @ 14.00, "
Bessemer Iron.....	14.50 @ 14.75, "
Warm-Blast Charcoal.....	18.50 @ 20.00, "
Cold-Blast Charcoal.....	25.00 @ 27.00, "

For deliveries running well up to the close of the year \$14.50 @ \$14.75 is asked for Bessemer, but nearly all the business now going is based on \$14.50. We note a sale of 3000 tons of Bessemer at \$14.60, deliveries running into August, and a sale of 2000 tons at \$14.50, for delivery in April, May, June and July; also a sale of 500 tons of Gray Forge at \$12.55, cash, at furnace.

Ferromanganese — Is unchanged at \$62.50 @ \$63 for domestic. No foreign has been sold here for months, as it cannot be sold in competition with the home product.

Steel Billets.—We can report a slightly better feeling and prices are ruling firm at \$23, for close delivery. For contracts running up to the close of the year from 25¢ to 37½¢ additional is obtained. We are advised of a sale of 20,000 tons at \$23.37½¢, at mill, the deliveries being 2500 tons per month and run from April to December, inclusive, of this year. It is said that this order was divided between Pittsburgh and Wheeling, the former filling 1500 tons per month and Wheeling 1000 tons. We also note a sale of 3000 tons by Pittsburgh, for equal deliveries in August, September and October, at \$23.25, at mill. Other transactions involving considerable amounts will probably be closed this week.

Steel Plates.—The situation is about the same as noted last week. The business doing is almost entirely for small lots, and does not represent sufficient tonnage to keep the mills more than fairly busy. We quote as follows: Fire Box, 3.75¢ @ 4.15¢; Flange 2.25¢ @ 2.30¢; Shell, 2.15¢; Tank, 1.90¢ @ 1.95¢.

Structural Material.—Business does not show any improvement and is falling far short of expectations. In Pittsburgh no less than four large buildings are under contract in which wood will be used in place of Iron and Steel. Pittsburgh seems to be behind other large cities when the question of putting up fire-proof structures is considered. A notable exception to this is the new home of the Pittsburgh Times, now about completed, and which is said to be absolutely fire proof throughout. We have reduced prices on Beams and Channels and quote as follows: Beams and Channels on a basis of 2.15¢ for desirable orders and 2.30¢ for small lots. Angles, 1.90¢ @ 1.95¢; Universal Mill Plates, 1.90¢ @ 2¢; Tees, 2.50¢; Refined Iron Bars, 1.75¢; Steel Bars, 1.75¢.

Wire Rods.—A slight decline in prices has occurred, due undoubtedly to the small amount of business being offered. We quote at \$32.50 at mill and note a sale of 600 tons at \$32.40 at mill for delivery in April.

Steel Rails.—We are not advised of any important orders being placed since our last report. Prices continue at \$30, f.o.b. at mill. It is announced that the Cleveland Rolling Mill Company will be in the market about April 1 next.

Muck Bar.—The activity in Soft Steel has caused the demand to almost disappear completely. Unless a better demand comes soon there will undoubtedly be a further shut-down of puddling furnaces in this district. It is said that no little uneasiness exists just now among the puddlers in the Pittsburgh district, as the signs of the times point to the fact that the days for puddling at \$5.50 per ton will soon be a thing of the past. We quote at \$24.50 @ \$24.75, in the absence of sales.

Barb Wire.—A continued active demand is reported, and prices are firm. Should the present active demand continue an advance in prices will probably be made. We quote as follows: \$2.25 @ \$2.35 for Painted, and \$2.70 @ \$2.80 for Galvanized, f.o.b. at factory, the lower prices named being for carload lots.

Nails.—There is practically nothing doing in Cut Nails and the outlook does not promise anything better. Some fairly large shipments by river have recently been made to Southern points by Wheeling, where Wire Nails have not come into as general use as in other parts of the country. The establishment of a Wire Nail factory in the Wheeling district in the near future is among the probabilities. The demand for Wire Nails is hardly as active as it has been, but manufacturers thus far have refused to make concessions. We quote at \$1.70 in carload lots, and \$1.75 in smaller quantities.

Manufactured Iron.—The same dull situation continues and the future does not hold out any promise of an improvement. Some few concerns may be said to be fairly busy, but they are the exception. The time is fast approaching for the annual convention of the Amalgamated Association, and there is considerable speculation being indulged in as to whether that organization will agree to formulate a new scale which will be consistent with the present condition of the Iron industry. A difference of \$2 and \$2.25 for boiling between the East and West is too great to continue. We quote prices as follows: No. 1 Bars at 1.60¢ @ 1.65¢, 60 days, 2% off for cash. Bars from Old Rails at 1.50¢ @ 1.55¢.

Plate and Tank Iron we quote at 1.70¢ @ 1.80¢; No. 24 Sheet at 2.50¢ @ 2.60¢, 60 days, or 2% off for cash. Skelp Iron is ruling at 1.60¢ for Grooved and 1.80¢ for Sheared, four months, 2% off for cash.

Wrought-Iron Pipe.—The demand does not show any improvement, but manufacturers hope that with the opening of spring and an improvement in the country roads a better condition of trade will come. The announcement that the National Tube Works Company will enter the Steel Tube business has set other manufacturers to thinking, and other concerns will take steps in this direction in the near future. The competition for trade offered by Wheeling has demonstrated that other manufacturers, to protect their interests, must move as soon as possible. It is impossible to name prices ruling, as no attention is paid to official discounts.

Old Rails.—A slight change for the better was noted last week, and a few sales of both Iron and Steel Rails were made. Dealers say they can get better prices for short lengths measuring less than 6 feet than for long lengths. We quote as follows: \$16.75 @ \$17 for lengths under 6 feet, \$16.25 for miscellaneous lengths and \$16.75 for long lengths. We can note the first sale of Old Iron Rails made here for some months. It was for shipment to the Mahoning Valley and amounted to 950 tons, the price being \$21.62½, delivered.

Scrap Iron.—There was a little better feeling last week, but prices are still very low. We quote as follows: No. 1 Railroad Wrought Scrap, \$17.75 @ \$18 per net ton; Cast Scrap, \$12.50 @ \$13 per gross ton; Steel Rail and Bloom Ends, \$17.50 @ \$18; Cast-Iron Borings, \$9.50 @ \$9.75 per gross ton; Mixed Country Steel, \$14 @ \$14.25 per gross ton. We note a sale of 300 tons of No. 1 Railroad Wrought Scrap at \$17.65, net.

Railway Track Supplies.—Business does not show any gain in sales, but a fair amount of orders are being placed. We quote as follows: Spikes, 2.15¢, 30 days; Splice Bars, 1.70¢ @ 1.80¢; Track Bolts, 2.65¢ with Square and 2.75¢ for Hexagon Nuts.

Louisville.

LOUISVILLE, Ky., March 21, 1892.

Buying for immediate delivery continues quiet, though purchasers are willing to buy for delivery the latter part of the year provided prices can be obtained on basis of \$9.25 for Gray Forge at furnace. Some sales have been accepted at this price, as it is felt that there will be but little movement in Iron for some time to come, owing to heavy stocks, and it being Presidential year is an additional factor that has to be considered.

Stove business continues dull, but there is a picking up among pipe works, though sales are yet on a very low basis, and while there has been some heavy buying of Iron to cover contracts for pipe taken, in some of the large contracts taken recently prices of pipe have been so low that these companies feel that there is no encouragement for them to buy save for what Iron is needed to cover contracts.

One party states that the supply of pipe at the present moment is nearly 1000 tons a day greater than the demand, and that it is causing very sharp competition among those engaged in the manufacture.

Among car companies business still remains active, with contracts ahead for some time. With passenger work they are especially full. One of the railroads that recently had inquiry out with seven different companies for passenger work reported that only one was able to furnish

cars promptly, and many others stated that they were full of passenger work until the end of the year, owing to the very heavy demands being made upon them by roads who anticipate a large amount of business during the exposition year.

Rates have been slightly changed to points north of the Ohio River from the Southern district, and it is reported that a slight change will also be made to tide-water.

Old Wheels remain at about \$16, on cars here.

We quote for cash, f.o.b. cars, Louisville:

Southern Coke, No. 1 Foundry...	\$14.00 @ \$14.50
Southern Coke, No. 2 Foundry...	13.00 @ 13.50
Southern Coke, No. 3 Foundry...	12.50 @ 12.75
Southern Coke, Gray Forge...	12.00 @ 12.25
Southern Charcoal, No. 1 Foundry...	15.75 @ 16.75
Southern Car Wheel, standard brands	18.00 @ 19.00

G. H. Hull & Co., Louisville, are agents for the Embreeville Furnace, the new stack recently started in East Tennessee.

Cleveland.

CLEVELAND, Ohio, March 21, 1892.

Iron Ore.—Quotations seem to be getting back to the 1891 mark. There is very little talk now of anything like a 40¢ or 50¢ advance over last year's prices for Ore. Indeed, very little Ore is being sold, and it is doubtful whether or not 500,000 tons of Bessemer have been let go during the present month. The past week has witnessed a few sales, but at prices substantially the same as were paid for the same grades of Ore in 1891. Vessel men are opposing the efforts being made to reduce transportation rates from 10¢ to 15¢ per ton, but it seems likely to be done, for all that. The Pig-Iron market is so thoroughly depressed and so completely devoid of life that furnacemen are more than justified in their efforts to get all material at the lowest possible figures. The initial sales of Bessemer this year were on the basis of a 35¢ advance over last year's quotations, about 20¢ of this sum going to the vessel men. It is safe to say that no more Ore will be sold at a corresponding advance, unless there should be a remarkable improvement in the condition of the Pig-Iron market. During the past eight days 30,000 tons of Ore were sent forward to the furnaces from Cleveland, against 9600 tons for the corresponding eight days in 1891. Shipments from other Lake Erie ports were also very heavy. The docks will be well cleared up by the opening of navigation, which to-day is scheduled to take place about April 10. Buyers of Mill Irons are doing nothing this week.

Pig Iron.—The market is about as dull as it can possibly be. Prices are already low and many furnaces are shutting down this week. The talk of cheaper rates for transporting Ore, Limestone and Coke is encouraging, but just now the sky is very dark. If there have been any sales of importance during the past week no one in authority seems cognizant of the fact. Furnacemen keep up their spirits remarkably well despite this depression, and talk cheerfully of the good times to come when production has been reduced to the minimum and stock piles exhausted. In December and January the furnacemen named March as the month in which the market was to brighten up. Now they are not so sure that it will occur before July or August. It is believed that the time has come for heroic measures and they will be adopted regardless of consequences. Some inquiries for Bessemer Iron are reported to-day, the Iron to be delivered in May, but it is scarcely probable that any will be let go at the prices offered. American Scotch Irons are 10¢ per ton lower, because of a reduction of that amount in transportation rates.

Old Rails.—There have been a few sales during the past week at about \$21, and the market really shows some signs of life. Sales are, as a rule, however, confined to small quantities.

Manufactured Iron.—The market is not very active, the railroads not buying as freely as had been expected. Prices, however, are unchanged, 1.60¢ @ 1.65¢ being quoted at the mills. Quite a number of mills seem well engaged despite the depression in business.

Serap.—No sales of any consequence are reported, and the market seems dull from every standpoint.

Barb Wire.—A good demand is reported and there is talk of advancing prices.

Nails.—Steel Cut Nails have advanced to \$1.65 per keg and the demand is fair. Steel Wire Nails are still quoted at \$1.80. Prices for all metals are stronger and higher.

St. Louis.

Office of *The Iron Age*,
Bank of Commerce Building, St. LOUIS, March 21, 1892.

Pig Iron.—The Iron market is practically the same as last reported. Consumers are not disposed to buy largely, and sales are limited to moderate sized lots. Gray Forge is getting down very close to the \$9 mark; in fact, it is rumored that sales have been made at this figure. A sale of between 1500 and 2000 tons of N. 2 Foundry is reported to a stove works in Quincy, Ill., on the basis of \$10.20, at the furnace. Stocks continue to accumulate on the furnace banks, notwithstanding the curtailment of production caused by the shutting down of several furnaces. While this continues there seems to be little hope for any betterment in prices. The outlook is discouraging and furnace men are trying to get as much for their product as the circumstances will permit, but do not appear very well satisfied with the returns. It seems reasonable to suppose that prices have now reached a point where they cannot go any lower, but as this has been the impression for some months past, there is little or no encouragement in it. For ordinary quantities we quote as follows for cash, f.o.b. St. Louis.

Southern Coke, No. 1 Foundry,	\$14.50 @ \$15.00
Southern Coke, No. 2 Foundry,	13.75 @ 14.25
Southern Coke, No. 3 Foundry,	13.00 @ 13.50
Gray Forge.....	12.50 @ 12.75
Southern Charcoal, No. 1 Foundry.....	16.75 @ 17.25
Southern Charcoal, No. 2 Foundry.....	16.00 @ 16.20
Missouri Charcoal, No. 1 Foundry.....	15.25 @ 15.75
Missouri Charcoal, No. 2 Foundry.....	14.75 @ 15.25
Ohio Softeners.....	17.75 @ 18.75

Bar Iron.—Business in this department has shown some degree of activity since our last report. The railroad and car works have been liberal buyers, and during the week orders aggregating something over 5000 tons were placed on the basis of 1.60¢, half extras, f.o.b. cars at East St. Louis. Small lots from store command 1.75¢ to 1.80¢, according to quantity.

Barb Wire.—A steady trade is reported in this department. The unseasonable weather at present prevailing has caused something of a falling off in the demand, but mills are still very well supplied with orders. The outlook is very encouraging so far as volume of business is concerned, but prices are not as firm as heretofore. Nominally prices are quoted as follows: Less than car lots of Painted, \$2.60; Galvanized, \$3.05; carload orders are quoted at 10¢ per cwt. less than these prices. The prices above mentioned are shaded in some cases.

Wire Nails.—A steady demand is noted in this department. Some mills are shading prices, while others refuse to accept orders at less than \$1.95 for carload orders. We hear of sales, however, in carload quantities at \$1.88, f.o.b. cars East St. Louis. Jobbers quote from \$2.10 to \$2.15 for small lots.

(By Telegraph.)

Pig Lead.—The market is a trifle firmer at 3.90¢ @ 3.92¢, which is attributed to a little speculative element which has crept into the market. Demand does not improve in any sense whatever, and buyers are scarce at the prices mentioned above. The future does not hold out anything of an encouraging nature, and lower prices seem inevitable.

Spelter.—Continues dull and neglected. Nominally, price is quoted at 4.25¢, but no sales are reported at this figure. It is quite probable that if any one were rash enough to bid 4.20¢ the bid would be accepted before he would have time to retract it. The dullness in the Brass and Galvanized Iron trade is having a depressing effect on Spelter, and lower prices seem inevitable.

Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fourth and Main Sts., CINCINNATI, March 23, 1892.

Pig Iron.—The past has been an off week in the Iron trade, there being no large transactions, not because there was not plenty of Iron for sale, but buyers were indifferent about contracting for forward delivery on the basis of current prices. It is not at all improbable that they will have to pay more when they require Iron, but the enormous production staggers them. There is a general belief that production will be reduced, but it is difficult to tell where it is to be done. The South is evidently selling as much Iron as it is making, and probably the economy of production is as well understood there as anywhere. So that the curtailment, if any takes place, must be in the Northern districts. There is a growing demand for small lots of Iron for current consumption, ranging from one to ten carloads individually, which in the aggregate make a satisfactory volume of business of that kind. These sales are mainly on the basis of \$0.25 for Gray Forge at the furnace, and while this price could doubtless be shaded for large quantities for early delivery, there are few buyers who are in a condition to take advantage of it. The consolidation of the two most important Iron-producing companies in the South is expected to have a salutary influence upon the Iron trade in the long run, and already there are indications that it will be beneficial. There is no doubt that the low prices current are promoting consumption very largely, one evidence of which is that purchasers are asking that deliveries on contracts be hastened. There continues to be a good inquiry for Standard Car Wheel Charcoal Iron, with prompt sales of all offered at pretty full quotations, but the lower grades are neglected. Quotations are unchanged, as follows:

Foundry.

Southern Coke, No. 1.....	\$14.25 @ \$14.50
Southern Coke, No. 2.....	13.00 @ 13.25
Southern Coke, No. 3.....	12.25 @ 12.50
Ohio Soft Stone Coal, No. 1.....	16.00 @ 16.50
Ohio Soft Stone Coal, No. 2.....	15.00 @ 15.50
Mahoning and Shenango Valley.....	17.00 @ 17.50
Hanging Rock Charcoal, No. 1.....	19.75 @ 20.00
Hanging Rock Charcoal, No. 2.....	19.00 @ 20.00
Tennessee and Alabama Charcoal, No. 1.....	16.50 @ 17.00
Tennessee and Alabama Charcoal, No. 2.....	15.50 @ 16.00

Forge.			
Gray Forge	12.00	@	12.25
Mottled Neutral Coke.....	11.50	@	11.75
Car Wheel and Malleable Irons.			
Standard Southern Car Wheel, ..	19.75	@	20.00
Lake Superior Car Wheel and Malleable....	18.75	@	19.00

New York.

Office of *The Iron Age*, 96-102 Reade street, NEW YORK, March 23, 1892.

Pig Iron.—Dullness continues to reign supreme, buyers being very indifferent. The Thomas Iron Company report that customers who had been induced to swing off to other Irons are now again increasing their requirements of the Lehigh brands. The Thomas Iron Company have a stock of about 17,000 tons, of which about 14,000 are No. 1 and 2 Foundry, which is less than is usual at this time of the year. Shipments are now exceeding current product. The managers of the three leading Birmingham companies, during their recent protracted stay in this city, have spoken freely as to the marked lowering in cost of production secured during the past year. One of them reported cost as low as \$7.55, including a 50-cent charge for renewals and repairs. Others have matched this figure, and there is little doubt that the larger concerns are under \$8 per ton. Against that may be noted that good practice in the Lehigh Valley has achieved cost, with materials put in at the open market rate, laid down at tidewater, at \$13 @ \$13.50. Considering freights to market, and for better average of higher grades by the Northern furnaces, the cost delivered at tidewater here is very nearly the same with both sections. We quote Northern brands, \$15.75 @ \$16 for No. 1; \$14.75 @ \$15 for No. 2, and \$13.75 @ \$14 for Gray Forge, tidewater. Southern Iron sells at \$15.50 @ \$16.50 for No. 1; \$14.75 @ \$15.50 for No. 2 and No. 1 Soft, \$13.75 @ \$14.25 for No. 2 Soft; \$13.25 @ \$13.50 for Gray Forge.

Ferromanganese and Spiegelteisen.—The market is lifeless, with Spiegel nominally quotable at \$23 @ \$23.50 for 10 to 12%, \$26.50 @ \$27 for 20%, and \$62.50 @ \$63 for Ferromanganese.

Billets and Rods.—The market in this section is very dull, both for domestic and foreign Billets and Rods. We quote domestic Billets \$25.50 @ \$26, and domestic Rods \$35.50 @ \$36, tidewater, both nominally.

Steel Rails.—A sale of a lot of 10,000 tons by an Eastern mill is the only transaction of magnitude reported during the week. Those who have been circulating reports of sales under \$30.75 at tidewater do not seem to be aware that the arrangement entered into by the Rail mills does not contain any restrictions whatever as to selling price. Even if concessions were made, of which there is no evidence, they would not be in violation of the agreement. The Pennsylvania Steel Company have lately secured two round orders for Girder Rails, one for 10 miles of single track for the Brooklyn Atlantic Avenue surface road, and another of nearly like size for Baltimore. Cutting is general in the Light Rail trade, in which the price-lists are only nominal.

Manufactured Iron and Steel.—In Structural Material Steel the market is very dull, no transactions of magnitude having been closed since our last. The demoralization in the Plate market continues. Small lots of Beams are selling at 2.40@ 2.45¢, and round lots at 2.25@ 2.30¢. We quote: Angles, 1.9¢ @ 2.10¢; Sheared Plates, 1.85¢ @ 2.25¢; Tees, 2.40¢ @ 2.75¢, and Beams 2.30¢ @ 2.80¢; Channels, 2.25¢ @ 2.50¢, on dock. Car Truck

Channels, 2¢ @ 2.10¢; Steel Plates are 1.8¢ @ 1.95¢ for Tank; 2.1¢ @ 2.30¢ for Shell; 2.40¢ @ 2.65¢ for Flange; 2.60¢ @ 2.75¢ for Marine, and 3¢ @ 3.25¢ for Fire Box, on dock. Bars are 1.7¢ @ 1.9¢, on dock. Scrap Axles are quotable at 2¢ @ 2.20¢, delivered. Steel Axles, 2¢ @ 2.2¢, and Links and Pins, 2.1¢ @ 2.20¢; Steel Hoops, 1.9¢ @ 2.05¢, delivered.

Merchant Steel.—We quote: Hot Rolled Shafting, 1.90¢ @ 2¢; Machinery, 1.90¢ @ 2.10¢; Tire, 2¢ @ 2.25¢; Toe Calk, 2.20¢ @ 2.35¢, and Tool Steel, 5¢ @ 6¢, delivered.

Track Material.—We quote Spikes, \$2 @ \$2.05; Angles, 1.65¢ @ 1.70¢, and Bolts, 2.60¢ @ 2.75¢, delivered.

Metal Market.

Copper.—Although the strongest sort of circumstantial evidence is presented that some sort of combination or agreement has been entered into by producers on both sides of the Atlantic, nothing confirmatory of an alleged deal is imparted at headquarters. For that matter, it would appear to be the study of persons most prominently identified with the trade to create the impression that natural conditions are not only responsible for the advance in prices that took place last week, but for a further rise that is to go on record for the week under review. The suggestive fact remains, however, that the movement in prices here and in the European market has not only been remarkably harmonious, but so nicely timed that any doubt as to concerted action would seem to be practically out of the question. That particular effort to "boom" the market by speculative tactics of pronounced type has been made is beyond all doubt, and it is remarkable also that a most singular sympathetic rise has taken place in prices of Copper mine shares in both the European and the American markets. Regarding the volume of business during the past week reports are variable. Some go so far as to state that at least 3,000,000 lb of Lake Superior Ingots have been taken by consumers for April and later delivery, and that the total will ultimately turn out to have been 4,000,000 lb or more. In addition to this there appears to have been another sale of a large quantity of Anaconda Matte to European buyers at prices to be governed by those current for Merchant Bars in London at the time of delivery.

During the early portion of the week under review, the better part of 1,000,000 lb of Lake Superior Ingots were placed at 11½@ 11¾ for delivery during the two months. Subsequently purchases were made at 11½@ 12¢, for both speculative account and for consumption, while brokers who figure almost wholly in a speculative capacity had numerous orders to buy, and were bold with offers to purchase for delivery several months ahead at as high as 2½¢. Such offers were made in quarters where they would be most apt to have sensational effect and tend to create the impression that inside manipulation is not solely responsible for the sudden and remarkable rise in prices. On the Metal Exchange 100,000 lb for April and 100,000 lb for June delivery at 12.10¢ were recorded prior to bids of 12½ for larger quantities for delivery six months ahead, and, during the interval, the bureaus for dissemination of Copper news have been kept busy with sensational stories.

Casting Copper has kept pace with Lake Superior product in the upward movement, although not finding sale in relatively as large quantities, and an actual transaction on advance of 1¢ per lb has taken place. At the closing sellers appear to have placed their limits

at 12½ for Lake Superior Ingots and 12¢ for common casting Copper. Of the latter sales were reported up to 13¢ for early delivery.

Pig Tin.—In the face of heavy Straits shipments during the first half of the month, rather weak statistical position of the market and indifferent sort of movement of supplies into foreign and home channels of consumption, prices have been given an upward turn by operators who are nothing if not bold in their methods. Evidence is wanting of any new speculative interest being excited in the local market, although more outside buying in London has been reported, but new departures by the local representatives of the foreign manipulators have at least had the distinction of imparting a certain degree of novelty to the market. For example, about 200 tons of Straits Tin for prompt and current month delivery were taken up and April and later deliveries sold at even prices, while subsequently 25 tons were purchased for March at 19.85¢ and 25 tons sold for April at 19.80¢ by the same persons. While this most remarkable sort of speculative maneuvering has been going on the principal holders of spot stock have kept up a sharp skirmish for out of town business and sold more or less Tin at prices relatively lower than those that ruled on local dealings. For the present, 10-ton lots are quoted at 19.80¢ @ 19.90¢ net cash, and ordinary jobbing quantities at 20¢ @ 20½¢ as to terms.

Pig Lead.—During the fore part of the week under review some fairly large purchases were made at 4.10¢ @ 4½¢ by consumers. The quantity was estimated at from 1000 to 1500 tons, deliveries running about 60 days ahead. Since that time the movement has been slow, however, and prices have turned somewhat for the better under the influence of very fair demand and the stronger tone of the market for other metals. At the moment 4.15¢ is bid, and offers at less than 4.20¢ are the exception.

Spelter.—Depression is still the conspicuous feature in the market for this metal. Although Brass manufacturers are said to have made more or less liberal purchases of other materials used in their line, they appear very indifferent when it comes to Spelter, and to all accounts galvanizers manifest similar spirit. Upward of a dozen carloads of prime Western have been offered at 4½¢, and in remote cases that price has been shaded a trifle without gratifying results.

Antimony.—Prices are somewhat firmer, but business is yet rather slow and the demand merely of a routine character. Current quotations are 10½@ 11¢ for Hallatt's, 12½@ 14¢ for LX and 14½@ 15¢ for Cookson's, in wholesale quantities.

Tin Plate.—No improvement has taken place in the demand for spot goods, and the requirements of the larger consumers seem to be satisfied in a great measure by supplies coming forward on old contracts. Future deliveries have been taken to a moderate extent only, and at present are in irregular demand. Prices remain without radical change. We quote as follows for full weights: Coke Tins—Penian grade, IC, 14 x 20, \$5.25; J. B. grade, do., \$5.35; Bessemer do., \$5.30; Siemens Steel, \$5.37½. Stamping Plates—Bessemer Steel, Coke finish, IC basis, \$5.60 @ \$5.65; Siemens Steel, IC basis, \$5.75 @ \$5.80; IX basis, \$6.80. IC Charcoals—Melyn grade, 1 X, \$6.40; for each additional X add \$1.50; Allaway grade, \$5.75; Grange grade, \$5.85; for each additional X add \$1.20. Charcoal Terne—Worcester, 14 x 20, \$5.75; do., 20 x 28, \$11.35; M. F., 14 x 20, \$7.37½; do., 20 x 28, \$14.75; Dean, 14 x 20, \$5.50; do., 20 x 28, \$10.60; D. R. D. grade,

14 x 20, \$5.35; do., 20 x 28, \$10.25; Mansel, 14 x 20, scarce; do., 20 x 28, \$10.50; Alyn, 14 x 20, \$5.45; do., 20 x 28, scarce; Daffryn, 14 x 20, \$5.65; do., 20 x 28, \$10.90. Wasters—S. T. P. grade, 14 x 20, \$5.10; do., 20 x 28, \$10; Abercarne grade, 14 x 20, \$5; do., 20 x 28, \$9.70.

C. Kirchhoff, special agent of the United States Geological Survey, has issued the following preliminary statement of the production of Copper in 1891:

	1890.	1891.
	Pounds.	Pounds.
Lake Superior.....	100,745,277	114,222,709
Arizona.....	34,796,089	38,873,279
Montana.....	112,980,896	112,063,320
New Mexico.....	850,034	1,238,197
Colorado.....	3,585,601	6,396,878
Utah.....	1,006,636	1,562,098
California.....	23,347	3,397,405
Idaho.....	87,243	140,825
Eastern and South- ern States.....	378,840	296,463
Lead Desilverizers, &c.....	4,643,439	4,980,590
Total domestic Cop- per.....	259,098,092	284,119,764
From imported Ores and Pyrites.....	6,017,041	11,600,312
	265,115,133	295,810,076
Imports of Pigs, Bars, Ingots and Old....	663,676	3,154,557
	265,778,809	298,964,633
Exports of Ingots and Bars.....	10,890,058	69,279,024
	254,888,751	229,685,609
Fine Copper contents of Matte exported, estimated.....	31,000,000	50,000,000
Available supply....	223,888,751	179,685,609

Reports of stocks of Copper from the producers and the majority of smelters, with the exception of the Calumet and Hecla and the Quincy mining companies, show a decline from 60,840,870 lb on January 1, 1891, to 54,888,536 lb on January 1, 1892. All the lake companies, with the exception of the two named, report 10,-161,528 lb on the former and 16,154,170 pounds on the latter date, while Montana producers reduced their stock from 33,-615,987 lb to 17,827,866 lb. In the absence of the stocks of the concerns alluded to no general conclusions are warranted.

Financial.

The money market was unchanged last week, and call loans were at 1½ per cent. and 2 per cent. There was a slight variation on time rates, with good Stock Exchange collateral. The rates were: 3 per cent. for 30 to 60 days, 3½ per cent. for 90 days, 4 per cent. for 4 to 5 months and 4½ per cent. for 6 to 7 months. There was no increase in the supply. The demand from outside the city upon the banks was good, but light from within. Upon indorsed bills receivable the rates were the same as in the week previous.

There was no material change in the rates above stated up to the close of Tuesday, 22d inst.

The bank return showed a gain in cash of \$586,100, and in surplus reserve of \$3250, leaving the surplus reserve \$16,199,700.

The bank totals of March 19 compared as follows with those of March 12:

Loans and discounts.....	Increase.....	\$1,725,700
Specie.....	Decrease.....	714,700
Legal tenders.....	Increase.....	1,300,700
Deposits.....	Increase.....	2,331,400
Circulation.....	Decrease.....	6,700

Government bonds were firm, with closing quotations on the 19th as follows:

	Bid.	Asked.
4s, 1907 Registered.....	116	116½
4s, 1907, Coupon.....	117	117½
2s, Registered.....	100	...
Currency 6s, 1895.....	109	...
Currency 6s, 1896.....	111	...
Currency 6s, 1897.....	113	...
Currency 6s, 1898.....	116	...
Currency 6s, 1899.....	119	...

The quotations on Tuesday, 22d, were:

	First board.	Last board.
U. S. 4½s, 1891, extended.....	100	@ 100
U. S. 4s, 1907, registered.....	116	@ 116
U. S. 4s, 1907, coupon.....	117	@ 117
U. S. currency 6s, ...	109	@ 109

Exchange was in the main steady, but dull. Commercial bills were scarce, and there was a steady demand for remittance for stocks sold on European account. The closing rates were firm at \$4.86½ for long, and \$4.88½ for short. On Tuesday, 22d inst., the rates were \$4.86½ @ \$4.87 for 60 days, and \$4.88½ @ \$4.89 for sight, with an inactive and firm market.

There were no shipments of gold.

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, March 23, 1892.

Higher prices for all descriptions of Pig Iron warrants ruled during the past few days. Scotch moved up to 41/6, Cleveland to 37/9 and Hematite to 47/6. Stocks in Connal's stores show a further decrease and now include 493,000 tons Scotch and 145,000 tons Cleveland Pigs. The crisis in the Coal trade has served to enliven speculation in some degree, but interest has not extended much outside of Cleveland and Hematites. Holders offer to lend Scotch warrants at fair rates with a view to inducing freer operations, but the outside public are shy, owing to the power of the syndicate to manipulate the market. The consumptive and export demand for Iron continues spiritless, and the reduction in warrant stocks is due to idleness of Cleveland and Hematite furnaces, due to the colliers' trouble. There are at present, however, 78 Scotch furnaces in operation.

The Copper market has been excited and strong, and prices have advanced about £1. Various rumors regarding the alleged producers' combine have kept a lively interest in the market, and strong American advices have also tended to stimulate speculation, while the reduction of over 1438 tons in European stocks during the first half of the month has tended to increase confidence. Consumptive demand improved considerably during the past week, particularly for electrical supplies. Another block of 7000 tons Anaconda Matte has been sold for delivery over five months, price to be regulated by selling price of Merchant Bars in the London market.

Pig Iron is about 5/ higher and the market appears to be firm at the advance. The heavy Straits shipments are offset by moderate spot stocks and close control of the same. Speculation somewhat more active, without, however, much outside interest.

The Tin-Plate market has been slack and is somewhat unfavorably affected by rather adverse reports from America. Prices are no lower, although buyers appear to enjoy more or less advantage.

No new feature in the market for Old Iron, except that the demand for Wrought Scrap shows some improvement.

Cleveland Pig.—Although warrants have been more active, the movement in

makers' brands is still moderate, but prices are firm at 37/6 for No. 3, f.o.b. Middlesborough.

Scotch Pig Iron.—Sales of makers' brands have been moderate and at irregular prices. To-day's quotations are:

No. 1 Coltness,	f.o.b. Glasgow.....	52/6
No. 1 Summerlee,	"	50/6
No. 1 Gartsherrie,	"	50/
No. 1 Langloan,	"	51/
No. 1 Carnbroe,	"	44/
No. 1 Shotts,	" at Leith.....	52/
No. 1 Glengarnock,	" Ardrossan.....	50/
No. 1 Dalmellington,	"	47/6
No. 1 Eglinton,	"	47/
Steamer freighta, Glasgow to New York, 7/6,		
Liverpool to New York, 2/;		

Bessemer Pig.—The demand has been rather slow, but makers still hold at 49/ for West Coast brands, Nos. 1, 2 and 3, f.o.b. shipping port.

Spiegeleisen.—No further change in prices, but the market is easy and slow. English 20% quoted at 77/6, f.o.b. shipping port.

Steel Rails.—Makers have refused bids similar to those that were accepted last week, and the market is unsettled. Heavy sections quoted at £4 @ £4. 2/6, f.o.b. shipping port.

Steel Blooms.—A very slow market for these, and prices still nominal. Makers ask £4 for 7 x 7, f.o.b. shipping point.

Steel Billets.—Demand is light and the market barely steady. Bessemer, 2½ x 2½ inches, quoted at £4. 5/, f.o.b. shipping point.

Steel Slabs.—Sales light and the demand slow, but makers hold for former prices. Bessemer quoted at £4. 5/, f.o.b. at shipping point.

Old Iron Rails.—Buyers and sellers apart on prices. Business slow. Tees quoted at £2. 15/ and Double Heads at £2. 17/6 @ £2. 18/9, f.o.b.

Scrap Iron.—A fair trade passing at about former prices. Heavy Wrought Iron quoted at £2. 10/ @ £2. 12/6, f.o.b.

Crop Ends.—The market dull and unchanged. Bessemer quoted at £2. 12/6 @ £2. 15/, f.o.b.

Manufactured Iron.—There have been no changes in prices, and business continues moderate. We quote, f.o.b. Liverpool:

	£ s. d.	£ s. d.
Staff. Ordinary Marked Bars	8 10 0	@
Common "	6 10 0	@ 6 12 6
Staff. Blk Sheet. singles.....	7 16 0	@

Welsh Bars (f.o.b. Wales)..... 5 10 0 @

Tin Plate.—No change in the movements of buyers and sellers, and business continues moderate. We quote, f.o.b. Liverpool:

IC Charcoal, Alloway grade	14/ @ 14/6
IC Bessemer Steel, Coke finish.....	12/6 @ 12/9
IC Siemens "	12/9 @ 13/
IC Coke, B. V. grade 14 x 20.....	12/3 @ 12/6
Charcoal Terne, Dean grade.....	12/ @ 12/3

Pig Tin.—The market closes firm but quiet. Straits quoted at £89. 10/, spot, and £89. 15/ for three months.

Copper.—Realization by speculators caused a reaction in prices, and the market closes irregular. Merchant Bars quoted at £47. 2/6, spot, and £47. 12/6, three months' futures. Best selected, £51.

Lead.—The market has been quiet but quite firm at £10. 17/6 @ £11 for Soft Spanish.

Spelter.—More doing in this line and the market firmer at £21. 7/6 for ordinary Silesian.

HARDWARE.

Condition of Trade.

THERE HAS BEEN no important change in the volume of the demand or in the tone of the market since our last review. Merchants throughout the country are purchasing in fair but not heavy quantities, and there is some complaint on the part of the jobbers and of manufacturers in certain lines of some sluggishness in business, which is accounted for to a considerable degree by the severe weather which has prevailed and the condition of the roads in many parts of the country. The fact that the Iron market is in an unsatisfactory condition has also its effect on the demand for Hardware in general, as purchasers are deterred by their lack of confidence in prices from placing orders in excess of their early requirements. Our advices are to the effect that stocks in retailers' hands are unusually light, and this condition is also evidenced by the fact that many orders are received specifying goods which are required immediately. In the matter of prices the market is in substantially the same condition as at our last review, there having been exceptionally few changes of importance.

Chicago.

(By Telegraph.)

Heavy Hardware is fully as active as it has been. Orders are not so large, but they are more numerous than usual. A feature of the situation is the pressure for prompt shipment. Buyers can hardly get goods fast enough after they have sent in their orders, which shows how low they are letting their stocks run. The demand for Shelf Hardware shows steady improvement. Builders Hardware is moving in large quantities, manufacturers' agents being especially active in this line. Staple goods are improving to some extent, Barb Wire conspicuously leading in this regard. Country roads may now be expected to show some change toward a better condition, as the month of April is so near at hand. Thus far there has been no intermission to winter weather since early in February, when there were a very few mild days. Jobbers are constantly looking rather confidentially for an early movement in staple goods as soon as nature bestows a few days of genial sunshine. Prices are no firmer than they have been except on Copper and Brass Goods, which were influenced by the advance in raw material. Manufacturers of Pipe Fittings are likely to make a stiff advance shortly if ingot copper maintains the higher level now reached.

St. Louis.

(By Telegraph.)

Business continues to show a steady increase in comparison with the corresponding period of last year. The demand for Shelf Hardware is particularly heavy just now, and a fairly active trade is noted in Heavy Hardware. Just now the weather in the territory tributary to St. Louis is unusually inclement, but notwithstanding this business keeps above the average. Barb Wire and Wire Nails are being sold in large quantities, and prices are being shaded accordingly. Cut Nails are dull, with prices tending downward. Jobbers are not carrying very heavy stocks just now, as prices all seem inclined to weakness, and the disposition of the jobbers appears to be to buy in smaller quantities than usual. Retail merchants are falling into the same habit, and a steady trade without any spurts is the result. Prices change but little, but as stated above are inclined to weakness. Collections are good.

Notes on Prices.

Cut Nails.—The demand for Cut Nails is only moderate and the mills have no difficulty in taking care of orders, notwithstanding the fact that the production is somewhat curtailed by the stoppage of leading works and a somewhat reduced output of others. Prices are a little irregular, owing to the amount of stock on hand and number of orders booked by the different mills, but as a general figure for carload lots at mill \$1.45 may be named. Concessions are not made from this figure quite as freely by several of the Eastern mills as a short time ago, as there is a disposition on the part of Eastern manufacturers to ask slightly better prices. At the present time the lowest quotations seem to come from the West. The regular quotation for small lots from store in New York is \$1.75, carload lots on dock being held at \$1.60 to \$1.65.

Chicago, by Telegraph.—Steel Cut Nails are inactive in this district, manufacturers' agents reporting but few inquiries. The building season will now open very soon and the heavy trade is then looked for. Quotations are unchanged at \$1.60 to \$1.65 on 30-cent average. Jobbers quote \$1.70 from stock.

Wire Nails.—Prices are fairly well maintained at \$1.70 @ \$1.75 for carload lots at mill, but it is probable that a lower figure would not be refused for large and desirable orders. Manufacturers report the demand as only moderate, but are anticipating an early revival with the opening of spring business.

Chicago, by Telegraph.—Wire Nails are reported quiet by manufacturers' agents.

The agreement among the large makers appears to be well maintained and they are waiting with as much patience as possible for a revival in the demand. Their usual carload trade has for the time being fallen into the hands of the jobbers, who quote small lots \$1.90 and carloads, \$1.85.

Barb Wire.—The demand for Barb Wire continues large and manufacturers who meet current prices are full of business. Some of the mills have refused to make the extreme prices which are given by some of their competitors. As a result the market is characterized by some unevenness. A fair quotation is \$2.65 to \$2.70 for carload lots of Four-Point Galvanized at mill. Some of the manufacturers are holding at \$2.75 and report a moderate business. New York prices for local trade are on a basis of \$3.10 for small lots of Four-Point Galvanized, carload lots being held at \$3.

Chicago, by Telegraph.—Barb Wire is in better demand from jobbers, the country merchants ordering more freely. Manufacturers are still crowded with orders, but their prices are no firmer, and if any change is made it is in a downward direction rather than upward. Car lots are quoted \$2.35 to \$2.40 for Painted and \$2.80 to \$2.90 for Galvanized. Small lots are \$2.50 and \$3.05 respectively.

Tinware.—While there are still large quantities of cheap, low grade Tinware called for by the trade, there are indications of a reaction, as consumers are finding out the poor quality of such goods and their consequent expensiveness as compared with the better article. From the condition of the Tin Plate market, it is probable that there will be a further depreciation in the quality of such low grade goods, as Tin Plate as light as 80 pounds for the 14 x 20 size is being imported, with the prospect of being used quite freely in the manufacture of cheap goods. The result will be a still lower grade than has thus far come into general use. The unsatisfactory condition of the Tinware market has forced prices down to so narrow a margin that some of the manufacturers are apparently disposed to lower the quality of their goods, in order to meet current quotations. Others, however, refuse to yield to this tendency, and are not endeavoring to meet the quotations made by some of their competitors. At the same time, owing to the comparative dullness of business in the South, where the great demand for cheap goods comes from, there is probably less than the usual amount of business in goods of this grade.

Base Knobs, &c.—H. H. & C. L. Munger, 142 Lake street, Chicago, issue a circular giving prices on the extensive line of Base Knobs and Floor Stops which they carry in stock as agents of the manu-

facturers. The list is as follows, subject to a discount of 40 per cent.:

Base Knobs, Beach, Birch and Maple.

No.	Per gross.
1, 2½ inch unfinished in ¼-gross boxes	\$2.70
1, 2½ " " (in barrel lots)	2.60
2, 3 " " in ¼-gross boxes	2.90
2, 3 " " (in barrel lots)	2.80

Base Knobs, Walnut, Cherry and Ash.

No.	Per gross.
1, 2½ inch unfinished in ¼-gross boxes	\$3.20
1, 2½ " " (in barrel lots)	3.10
2, 3 " " in ¼-gross boxes	3.40
2, 3 " " (in barrel lots)	3.30

(Barrels contain about 10 gross each.)

Base Knobs, Ash, Beach, Birch, Maple, Black Walnut, Cherry, Red Oak, Natural Oak and Cherry Stain.

No.	Per gross.
1, 2½ inch finished in ¼-gross boxes	\$4.25
2, 3 " " "	4.50
3, 2½ " " "	4.50
4, 3 " " "	4.75

(Antique Oak add \$1 per gross.)

Base Knobs, Ash, Maple and Red Oak.

No.	Per gross.
5, 3½ inch finished in ¼-gross boxes	\$9.00

Base Knobs, Antique Oak, Mahogany and Bird's-Eye Maple.

No.	Per gross.
5, 3½ inch finished in ¼-gross boxes	\$11.00
No. 8 Floor Stops, Ash, Birch, Maple, Mahogany, Black Walnut, Cherry, Red Oak, Natural Oak and Cherry Stain.	
In ¼ gross boxes, per gross	\$10.00
(Antique Oak add \$2 per gross.)	

Glass.—There is a slight improvement noticed in the demand for Glass, both at factories and in this market, though the demand is far from being what could be desired. Any improvement in this direction is looked upon as encouraging, however small it may be. Prices do not seem to gain any strength with the coming of spring, and no printed quotations are considered bottom. There has been a report in circulation for the past two or three months that Western factories were intending to put forth efforts to secure the Eastern trade, which Eastern factories consider belongs to them. A report now comes from an Ohio Glass factory that some of the larger Pittsburgh manufacturers intend starting agencies in Eastern cities, particularly in New York, where single box customers will be given prices nearly as low as those offered for carload lots. Whether this will affect the market outside of the cities in which these agencies are established remains to be seen. This project may be abandoned if a fairly large demand should spring up in the near future. It is intimated by Glass Jobbers in this city that the large factories will pursue the policy of keeping prices at so low a point that smaller factories who have no money to lose will cease to exist. This, however, does not seem probable, in view of the action taken at a recent meeting, at which a beneficiary fund was provided for. Inquiries among the trade affords no information regarding the proposed revision of the list prices of Glass. Printed quotations are on the following basis: American Window Glass, 1000-box lots or more, 80, 10 and 5 per cent. discount; carloads, 80 and 10 per cent. discount; less than carloads, 80 and 5 per cent. discount; French Window Glass, 75 and 10 per cent. discount; American Plate is held at a discount of 50, 10 and 5 per cent., and imported Plate at a discount of 60 per cent.

Cuts for Retailers' Use.

WIIDE-AWAKE, enterprising Hardwaremen, in the smaller towns especially, find it advisable to give a good deal of attention to advertising in their local papers and find that any ingenuity and care given to this matter is labor well expended. There is thus afforded an opportunity for manufacturers to aid them at a moderate expense by furnishing them electrotypes of small size representing their goods. If it were understood through the trade that manufacturers of specialties were willing to furnish such cuts for retailers' use there is little doubt but that they would receive many requests for them, and their judicious use would stimulate a demand for the goods which would be profitable to the retailer as well as the manufacturer. At the same time the goods would be so advertised as to induce a larger sale, as they are brought not only to the attention of the public at large, but also to the attention of other merchants upon whom calls would very likely be made for them. The expense of furnishing small cuts would certainly seem to be trifling compared with the advantages to be derived therefrom. This is certainly a cheap and advantageous method of holding and securing trade.

The Gilbert & Bennett Chicago Factory.

THE GILBERT & BENNETT MFG. COMPANY, whose main works are at Georgetown, Conn., have just completed and are now occupying a branch factory in Chicago. Their products embrace a wide range of Wire goods, covering woven fabrics and shaped wares. The Chicago factory is designed as an auxiliary, for the purpose of putting the company in a position to meet the changes so rapidly taking place in the character of Western trade. The building just completed may therefore be regarded simply as a beginning, from which will grow a plant in accordance with the special requirements of the business as they are developed by time. The site secured is admirably situated both for handling railroad shipments and the city trade, being the west end of the block between Rebecca and Sixteenth streets, adjoining the old stockyards tracks, the Baltimore and Ohio and the Panhandle railroads. The stockyards tracks give the factory great advantages in reaching the entire railroad system of Chicago at low switching charges. A side track will be run into the company's grounds in the spring. Their present building occupies but one-fourth of the company's land, thus leaving them abundant room for expansion. It contains about 30,000 square feet of floor space, being 41 x 168 feet, four stories high, with an annex on the side to accommodate a steam elevator, stairways, &c. The building is of brick, of substantial mill construction, and strong enough to take three additional stories should they at any time be re-

quired. Driveways have been arranged at both ends so that teams can stand under cover. The machinery now in place has, of course, been selected to cover the class of goods at present most in demand from the Western branch. At the same time, however, attention has been given to providing facilities for turning out a general line, as great advantages are often realized by the Western branch in making prompt shipments to customers who are short of stock. While large orders will be filled as heretofore from the main factory, the Chicago works will be in a position to meet sudden emergencies. The growth of Western trade has been so rapid in recent years, however, that the time is quite confidently anticipated when it will be necessary to have the Western establishment as fully equipped as the Eastern works. The company's Chicago office and salesroom will be continued at 148 Lake street.

CYCLES.

(Continued from page 529, March 17.)

OVERMAN WHEEL COMPANY, Chicopee Falls, Mass., A. G. Spalding & Bros., special agents, are offering for 1892 their Victor Safety, model C; Victor Safety, model B; Victor Safety, model G; Victor Safety, model F; Ladies' Victoria Safety Bicycle; Victor Safety Bicycle, model E, and Victor Safety Bicycle, model D. The manufacturers state that they believe the above line of wheels satisfy all the requirements of riders under varying conditions. The Victor Cushion Tire and Victor Spring Fork are used, either combined or singly, at the buyer's option. The Victor Cushion Tires were used on all of their machines during 1891, and it is stated were, from the start, a grand success. Particular emphasis is placed upon the construction of the Victor Pneumatic Tire, and in this connection the point is made that it is essential to any high-grade pneumatic tire that it be made in two parts, the outer covering be reinforced by canvas and arranged to receive the thrust on the road; the inner tube made of pure rubber, to hold the air, and so constructed that it can be readily taken out in case of puncture and repaired, or replaced by a perfect tube. It is explained that the Victor Pneumatic Tire is so made that by opening an aperture in the rim the inner tube may be easily removed and another replaced without the use of tools. This is readily accomplished, it is stated, without removing the wheel from the machine. A hollow rim is used with this tire.

THE MONARCH CYCLE CO., 42-52 N. Halsted Street, Chicago, report themselves very busy, and as having numerous inquiries coming in regarding the Monarch machines. They have just completed their new factory, and in a few days expect to have everything in full operation. They are offering for 1892 the Monarch Cushion Tire; Monarch Pneumatic, of which an illustration was given in our issue of February 18; Gents' Empire Safety, and Ladies' Empire Safety. In their catalogue the manufacturers call attention to the facilities they have for manufacturing strictly high-grade Bicycles; and to their aim to put a machine on the market which shall surpass the very best of English wheels. Regarding construction they state that only the very finest steel tubing and drop forgings are used, and, in fact, in every detail the material is the best that can be produced. The Monarch will be ready for distribution in the near future, and is referred to

as a very handsome and desirable machine. They desire to have their wheels handled by responsible firms in all parts of the country, and are prepared to negotiate with those desiring a high-grade wheel. The company have on hand a limited number of their Empire Safeties, for both ladies and gentlemen, which they are offering at reduced prices. These machines were built last year, a large number of them sold, all giving satisfaction. The above wheels are referred to as being of high grade, embracing the most approved scientific construction, and as presenting an exceptional opportunity for any one desiring a first-class wheel for little money. The handsome new catalogue issued by this company is now ready for distribution. Attention is directed to their advertisement, which appears on page 81 of this issue.

THE HARRY SVENSGAARD BICYCLE COMPANY of Fergus Falls, Minn., have since last year made a radical change in their business. N. M. Littlejohn, a prominent and wealthy gentleman of Whitewater, Wis., has become associated with the company, of which he is now president. His son Ernest, a resident of Fergus Falls, is the secretary and treasurer, and Harry Svensgaard remains as manager of the concern. With the infusion of large capital thus secured, the company are in a position to do more business on a very much larger and successful scale than ever before, which they are pushing with great energy throughout the Northwest. They have nearly 500 agents already appointed in Minnesota, the Dakotas and Montana, and the manager is still on the road appointing more. Two salesmen are expected to start out about March 15 and keep on the road all the season. Besides doing business through agents, the company will supply wheels direct to purchasers at all points where their agencies are not established. A complete repair shop has been added to the factory at Fergus Falls, including enameling and nickelizing outfit. A large double brick block is occupied by the company.

The company's leading wheel this season is the Lion, a wheel of English make which is especially adapted to rough roads and touring. It is fitted with direct spokes, tangent spokes or pneumatic tires, according to the price.

The company also handle this season the wheels of the Western Wheel Works of St. Louis, the Rudge high grade wheels; the Sylph of Peoria, a spring frame machine; the Overland; and last, but not least, "Our Own Wheel," which as yet travels under the above title. A number of cheaper and boys' and girls' machines make up the Harry Svensgaard Bicycle Company's list for 1892.

Trade Items.

THE STRIKING ADVERTISEMENT of Brittan, Graham & Mathes, Pittsburgh, Pa., will be observed with interest by our readers, with the illustration which they give of one of their standard patterns. They also call attention to some of the special features of the line of Locks represented, and allude also to other patterns which they are putting on the market.

ANOTHER WESTERN INVENTOR thinks he has solved the problem of manufacturing Binder Twine cheap. He proposes to use bear grass, as it is called in Kansas, or Spanish bayonet, as it is known in New Mexico, or the succa plant, as it is also called. The inventor is J. H. Best, residing near Kansas City, and it is reported that he has, after years of experiment, perfected a machine for separating the fiber rapidly and satisfactorily.

NICHOLS BROS., Bernardston, Mass., have recently added to their line a variety

of Knife Handled Butchers' Cleavers, which are represented in their 1892 catalogue, which they regularly carry in stock, furnishing round handles to any who prefer them. They refer to their experience in the markets and slaughtering trade as aiding them in furnishing this class of trade a tool specially suited to their needs in shape, quality and finish.

THE PARTNERSHIP formerly existing between J. L. Tatnall, S. T. Dorsey and Harrison Gould, under the firm name of Tatnall, Dorsey & Gould, Piedmont, Ala., has been dissolved by mutual consent. Mr. Gould has retired from the firm. The other partners will continue the business at the old location, under the firm name of Tatnall & Dorsey, and will collect the debts and assume the liabilities of the late partnership.

THE TRADE WILL OBSERVE among the Special Notices the advertisement for a young man acquainted with the trade in New York City and familiar with Builders' Hardware. The opportunity is certainly deserving the attention of any who may have the requisite qualifications, as the advertisers are a well-known house.

IN NOTICING the catalogue of Joseph Rodgers & Sons, Sheffield, England, for whom Alfred Field & Co., 93 Chambers street, New York, are sole United States agents, in our last issue, we made some remarks incidentally concerning the business of these widely known manufacturers. In referring to their annual output we were, however, in error in stating that among other goods they turned out 166,000 Table Knives and Forks and 133,000 Pocket Knives. The proper statement would have been 166,000 dozen and 133,000 dozen respectively, the omission of the word dozen creating a very great discrepancy. The above catalogue is the first issued in America representing these goods, but is not the only catalogue ever issued by the manufacturers, who have on more than one occasion compiled elaborate illustrations of their line in Sheffield.

THE DUMONT COMPANY, exporters and commission merchants of 56 New street, New York, agents of Spanish-American Press and proprietors of *El Anunciador*, have opened a branch office at 101 Lake street Chicago, under the management of D. W. Bushnell.

GEORGE B. KERR, agent of the Scovill Mfg. Company of Waterbury, Conn., has received at his store, 210 Lake street, Chicago, a number of samples of the fine work now being turned out by that company in Aluminum. They have recently filled some large orders for Aluminum Match Boxes of the most artistic design, also Aluminum Panels of exquisite finish. The company have latterly been turning their attention to specialties of this character, finding a good demand for work requiring the happy combination of artistic conception and mechanical skill. There are sundry important branches of trade in which the distribution of *souvenirs* is almost an established custom, and to these the Scovill Mfg. Company present excellent facilities for the production of novelties.

THE ZIMMERMANN SYBURG COMPANY are successors to Chas. O. Schwartz Stove Company, Milwaukee, Wis., and will continue the business at the old stand, 291 Third street.

THE BRONSON SUPPLY COMPANY, Cleveland, Ohio, and 72 Beekman street, New York, advise us that the sales of their Never-Break Wrought Steel Cooking Utensils so far this season are considerably in excess of the same months in any of the previous two or three years that these goods have been on the market. The company are accordingly making arrange-

ments to increase their output, especially in Kettles and Porcelained Ware. The durability and excellent quality of the Never-Break goods are referred to by the company as responsible for the popularity thus indicated.

THE COPARTNERSHIP heretofore existing between Joseph Michel, James T. McDonough and Theo. Michel, under the firm name of Theo. Michel Mfg. Company, St. Paul, Minn., has been dissolved by mutual consent, Joseph Michel and James T. McDonough retiring from the manufacturing department of the firm and continuing the retail Hardware and plumbing business at the old stand under the name of Michel & McDonough. The latter firm will pay all outstanding bills of Theo. Michel Mfg. Company, and is also authorized to receive and receipt for all outstanding claims and demands of said firm up to March 1, 1892. Theo. Michel remains in the manufacturing business, and has associated with him Ernest Seitz, and they will continue it at 743 Wabasha street under the old name of Theo. Michel Mfg. Company.

H. B. HUNT of the firm of Hunt & Walters, Rochester, N. Y., has disposed of his interest in that business to Harry Walters, who has taken in as partner George Mears, for a long time connected with the house. The style of the new firm will be Walters & Mears.

WE ARE ADVISED that the Harness and Saddlery business of E. Alexander & Co., Staunton, Va., will in future be carried on by Frank Alexander & Co. of that city as one of their departments. The stock in this line will be enlarged.

THE FIRM of Sievers-Carson Hardware Company of Louisville, Ky., has gone into liquidation. They are paying dollar for dollar, and after the business has been closed up the stockholders will have a substantial dividend besides. At a recent meeting it was resolved to retire from business, and to facilitate the winding up the Columbia Finance Company were appointed agents to close the stock out and complete the settlement.

IN A RECENT ISSUE we stated that J. W. Poor had purchased the Hardware business formerly conducted by M. B. Maxson, Marvin, S. D. The first initial of Mr. Poor's name was, however, incorrect, P. W. Poor being the style of the new firm.

CRANSTON & JENNINGS, 60 Wabash avenue, Chicago, have been appointed sole selling agents for the Hartford Hammer Company, Hartford, Conn., for the following States: Illinois, Michigan, Wisconsin, Minnesota, North Dakota, South Dakota, Nebraska, Iowa and Missouri. The Western business on these Hammers has thus been placed in their hands, and they suggest that parties wishing catalogues and prices should write them for such matter. They also refer to the satisfactory business they are doing in this line of goods.

THE PETERS CARTRIDGE COMPANY, Cincinnati, Ohio, for whom J. C. McCarty & Co., 97 Chambers street, New York, are agents, have won the suit brought against them by the Standard Cartridge Company of Chicago for the ownership of an important patent on an improved form of Cartridge loading machine. There had been two prior decisions by other tribunals in favor of the former company, but the Standard Cartridge Company appealed in both cases. The decision above was rendered by the Commissioner of Patents, and is referred to as the final decision, from which there is no appeal.

VITRIFIED WHEEL COMPANY, Westfield, Mass., are calling attention to their Cyclone Wheel for saw filing, gumming and planer knife and tool grinding, mentioning its strength and safety, rapid cutting, durability, and the fact that it will run dry

as well as in water. The company are making these Wheels with bevel, square and open faces or any other shapes desired. They carry a full stock of Cup Wheels of all sizes for knife and surface grinding, as well as 22, 24 and 26 inch Wheels for automatic knife grinding.

THE CREEDMOOR CARTRIDGE COMPANY, Barberton, Ohio, which entered the field in competition with the manufacturers identified with the Ammunition Association, has come under the control of Eastern parties who are understood to be connected with the Association. The board of directors at the present time includes several prominent business men of Akron, Ohio, with the addition of M. Hartley, T. G. Bennett and W. J. Bruff, representing the other manufacturers.

THE NEW ENGLAND SPECIALTY COMPANY, North Easton, Mass., manufacturers of Hardware specialties, of which Aug. J. Leavitt is manager, have added a Plating Dynamo to their works, and are now nickel plating their Hammers and other goods at a slight advance in cost over polished work.

GASTON, WESTON & LADD, 15 Murray street, New York, advise us that business is very satisfactory in their line, and that their removal from Beekman street was a good one in view of the increased sales which have ensued. They call special attention to their Prestoline for metal polishing, which they describe as manufactured by a secret process, upon a scientific basis, by which it is claimed the materials cannot vary or the product deteriorate. The gratifying reception which it has met at the hands of the trade is also referred to. Prestoline is made in both Paste and Liquid, the latter being especially adapted for household use, harness rooms and by engineers, as it takes hold quickly and polishes easily with a brilliant luster. Prestoline is of a bright cream color, and leaves, it is stated, no smut or stain, and can be used without soiling the most delicately finished wood work, making it particularly adapted for highly polished metal door trimmings. It can also be used equally well, we are advised, upon hot or cold metals, and will not deteriorate with age. Prestoline Liquid is put up in half-pint, quart and gallon cans with cork-filled screw tops, making it suitable to handle and presenting it always in a merchantable condition. The No. 1 size, the size generally sold, is packed three dozen cans in a case, with a display banner for show windows in each case.

ON TUESDAY AND WEDNESDAY, March 29 and 30, Haydock & Bissell, 12 Murray street and 15 Park Place, New York, will conduct a trade sale of Table and Pocket Cutlery, Carvers, Butcher Knives, &c., together with Cast Steel Nickel Plated Scissors and Shears, Silver Plated Tea and Table Spoons, &c., and an assortment of eight-day Clocks. Particulars in regard to this sale are given in their special notice on another page.

THE ACKNOWLEDGEMENTS of the trade are due to the proprietors of the Cosmopolitan Hotel, corner of Chambers street and West Broadway, for their courtesy in giving the members of the trade the use of their parlors for conferences in connection with the formation of the Hardware Club and also for meetings relating to the recent Hardware dinner.

THE BALDWIN WOODEN WARE CO., Lafayette, Ind., sends us circulars advertising a Combination Washboard and Broom Rack for displaying these articles in stores, the Wire Washing Machine, made with a corrugated wire surface on the bed of the machine and on the rotating rubber; Extension Clothes Racks, Adjustable Clothes Racks, Shelf Racks and Butter Molds.

New York Hardware Club.

IN ACCORDANCE with the call published in our last issue there was a large and enthusiastic gathering of Hardwaremen in the parlors of the Cosmopolitan Hotel last Saturday afternoon to consider the organization of a Hardware Club. The gentlemen present represented many

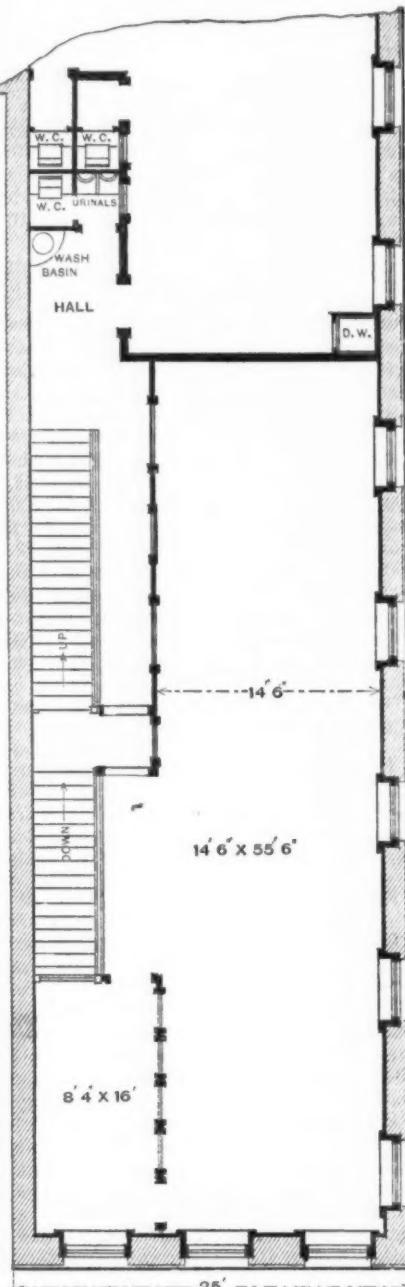
of Underhill, Clinch & Co., who reported that an arrangement could probably be made to obtain rooms over Wiehl & Widmann's (formerly Schedler's), well-known restaurant, corner of Chambers and Church streets, and that an arrangement could also be made by which dinner could be served from the restaurant either *table d'hôte* or *à la carte*.

After some discussion as to the best method of proceeding, a Hardware Club was formally organized, and the gentlemen present pledged themselves to membership with the understanding that the total expense for the first year, including initiation fee and dues, should not exceed \$50. On this basis more than 50 memberships were taken. The following houses designated the number of memberships to which they pledged themselves, without at that time naming the individuals who would hold the memberships:

H. B. NEWHALL COMPANY, 2.
THE IRON AGE, 5.
SCHOVERLING, DALY & GALES, 2.
VAN WAGONER & WILLIAMS CO., 2.
SURPLESS, DUNN & ALDER, 2.
MILLER, SCHLOSS & SCOTT, 2.
J. C. McCARTY & CO., 2.
DUNHAM, CARRIGAN & HAYDEN CO., 3.
HAWLEY BROS. HARDWARE CO., 1.
MALLORY WHEELER CO., 1.
ARCADE FILE WORKS, 1.
YALE & TOWNE MFG. CO., 1.
MALTBY, HENLEY & CO., 1.
J. H. GRAHAM & CO., 1.
FRASSE & CO.; 1.

The following gentlemen, whose names will be recognized as representatives of well-known houses, also pledged themselves to membership:

ROBERT SICKELS.
A. P. MITCHELL.
PETER MCCARTEE.
R. H. SWAYZE.
A. G. SHERMAN.
W. S. FEARING.
E. C. VAN GLAHN.
CHAS. MORRILL.
J. H. GOLDEY.
HEZEKIAH KING.
H. H. WOODROUGH.
R. L. WOODROUGH.
CHAS. BRUFF.
MR. REYNOLDS.
C. A. BAYNON.
H. C. MARSHALL.
R. K. CARTER.
W. H. QUINN.
J. F. CURLEY.
W. R. WALKLEY.
F. B. THURBER.
A. D. CLINCH.
W. R. McCULLOUGH.
C. F. GUYON.
J. L. VARICK.
J. D. FOOT.
D. B. McILWAINE.
W. C. DODMAN.
WILLIAM C. PAGE.
EDWIN T. SMITH.
THOMAS J. ATKINS.
GEO. MUNSON.
W. W. GLOVER.
J. P. TOPPING.



*Hardware Club Rooms, Chambers Street
Corner of Church.*

of the leading houses of the city, and there was substantial unanimity of feeling in regard to the desirability of establishing such a club. Webster R. Walkley of the Peck, Stow & Wilcox Company was chosen chairman of the meeting and J. L. Varick of the Union Nut Company secretary.

The matter was brought before the meeting in definite shape by A. D. Clinch

After a further discussion in regard to different aspects of the matter and features which it would be desirable to embody in the club, the whole matter with power to act was unanimously referred to the following committee:

W. R. WALKLEY.
A. D. CLINCH.
PETER McCARTEE.
W. H. WILLIAMS.
EUGENE BISSELL.
J. L. VARICK.

The accompanying diagram represents the premises as first suggested for the club, the partition 55 feet and 6 inches from the front being the boundary between the rooms of the club and proposed addition to their restaurant which Wiehl & Widmann were contemplating making. The space which would thus be placed at the disposal of the club would have a depth of 55 feet and an extreme width of 25 feet, some of which would be occupied by stairways and partitions. On a careful canvass of the matter the committee have decided that this space would be insufficient and have accordingly made an arrangement by which they secure the whole floor, thus obtaining a room 25 feet wide and about 100 feet in length. Under the new arrangement the toilet rooms will be placed in an L, not shown in the diagram, which will thus leave at the disposal of the club exceptionally desirable premises with excellent light, giving them all the room required in the very center of the Hardware district. It is the intention to proceed at once in the matter of putting in the requisite partitions dividing the floor into the different rooms which will be required, after which they will be decorated and furnished in an appropriate and attractive manner so as to render them adapted to the different uses of the club.

The project is certainly inaugurated under very favorable auspices, and the movement has every prospect of being a complete success. The trade are to be congratulated that it is under the direction of gentlemen in whom all have entire confidence, and who will proceed in the matter with the best care and judgment. It is expected that the dining feature will be an important element in the success of the club, as the members of the trade will thus be brought together and under exceptionally favorable circumstances. The club are to be congratulated on being free from the difficulty and responsibility of conducting a restaurant or dining room of their own and on the arrangement with Wiehl & Widmann by which they will, without doubt, be exceptionally well served.

No effort has as yet been made to secure memberships among the trade, those enumerated above having been volunteered without solicitation, and there is no doubt that many others will be glad to avail themselves of the opportunity of thus identifying themselves with an organization which will adequately represent the New York Hardware trade and be the means of promoting acquaintance as well

as serving other common ends. Those who are desirous of joining the club will do well to communicate at their early convenience with the Executive Committee named above. It is not unlikely that it may be necessary before long to limit the membership.

In addition to the membership of the trade resident in New York it is intended to provide for non-resident memberships at considerably reduced charges, which will permit manufacturers and merchants outside of the city to enjoy the privileges of the club. This plan contemplates fitting up the room in such an attractive and convenient manner as will give facilities for correspondence, meeting with members of the trade, conferences of associations, &c. In this way it is hoped that many manufacturers and jobbers out of the city will find it to their interest and pleasure to be identified with the club, and that thus the club may be an organization which shall suitably represent the trade in Hardware and related goods centering in New York.

We desire especially to congratulate the trade on the unanimity which characterizes this movement and the spirit in which all unite to carry the project to a successful completion.

The meeting last Saturday adjourned to meet next Saturday, 26th inst., at 2.30 o'clock, at the Cosmopolitan Hotel, corner of Chambers street and West Broadway. It is hoped that at that time there may be a full representation of the trade, as important matters will come before the meeting.

Trade in Louisville.

WE HAVE the following advices from a special correspondent in Louisville, in which a discouraging condition of things is portrayed:

The Hardware trade of Louisville, Ky., has been seriously impeded the past week by the unprecedented heavy snow storms passing over this place and nearly the whole South. The severe cold has caused great depression all through the fruit regions, in some cases causing total destruction of fruit prospects. Spring plowing has been thrown back fully two weeks, and great destruction has been done to grass and clover seeding. No oats have as yet been planted through our section, and although this is not a money crop, it is quite an item in farm economy. As yet wheat is not injured much. Happily this cereal is deeply rooted in American soil. Such outdoor depression naturally affects the merchants indoors, and consequently the jobbers are not very busy. And to make things a little bluer for the big dealers, there have occurred several cuts on staple lines of goods, showing weakness in the manufacturing centers. Principal among them are breaks in Barbed Wire and Wire Nails, in both of which considerable stiffness has ruled for some time. It is with great regret the fact is realized, at present writing, that the Wire Nail agreement has gone to pieces. Lower prices will hardly cause any more fencing to be put up, or buildings to be erected, but yet the old seesawing will go on continually. Bar Iron is quite steady in prices, because it cannot go any lower on account of wages remaining up. This matter, as voiced in *The Iron Age* of March 10 has got to be met by men and masters (Query: Who are

the masters, workmen or mill owners?), and the sooner it is discussed the better. It is not probable that the great pulsoemeter Pig Iron will recover in prices any at all before next fall, as the big furnaces are trying to sell for the full year's delivery at present prices, showing that they do not expect it. Wages are unevenly too high, and the men will probably realize the necessity of a lower adjustment, in order to keep running. Notwithstanding the lower range of prices a large jobbing business is carried on, and to keep up the supply they are taking in large quantities of goods, but buying in conservative ways, seldom placing a long-time contract without ample protection against declines.

Price-Lists, Circulars, &c.

WM. H. HASKELL COMPANY, Pawtucket, R. I., Henry B. Newhall Company, 105 Chambers street, New York, agents: Catalogue Gimlet-Pointed Coach Screws, Machine Bolts, with round, square and hexagon heads, Plow and Cultivator Bolts, Tap Bolts, Milled Cap Screws and Set Screws, Clinch Rings, Cold-Punched Square and Hexagon Nuts, Clearer Springs, Chain Links, Levers and Stirrups, Rods, Bolts and Iron Work for Buildings. Their 1892 catalogue is substantially bound in cloth, containing 127 pages of illustrations and price-lists of their goods. Near the front of the book is a full-page engraving of their works, followed by a list of the company's officers, who are as follows: Wm. H. Haskell president; E. S. Mason treasurer; D. A. Hunt agent. The paper used is of fine quality, and the cuts are clear and well defined. Special attention has been given to the arrangement of list, the prices being in heavier type than the remainder of the lists.

DE WITT WIRE CLOTH COMPANY, 32 Reade street, New York: Price-list, 1892, of Adjustable and Side Extension Wire Window Screens and Wire Screen Doors, attention being also called to Galvanized Steel Wire Netting, Galvanized Steel Twisted Ribbon Fencing, Tempered Steel Galvanized Elastic Wire Cables for fencing, &c. Another circular is devoted to their Steam Loom Painted Steel Wire Cloth, extra heavy painted, all double selvage, green, drab and black, fancy figured and landscape. A calendar for 1892 is also issued.

THE NATIONAL SAW COMPANY, 96-98 Reade street, New York, issue a catalogue of the goods made by the Wheeler, Madden & Clemson Mfg. Company, Middletown, N. Y. They state that the Steel used in their Saws is produced in their own steel works. After many years' experience of what is needed in this class of tools and long experimenting, they state that they have succeeded in producing a special crucible steel for this purpose, which is referred to as being tough, durable and well suited for the purpose. Their Saws are tempered by a new and secret process, and particular attention is given to finish as well to other details. The National Saw Company also own and operate Woodrough & McParlin, Cincinnati; Woodrough & Clemson, Boston, and Monhagen Steel Works, Middletown, N. Y.

BRITTAN, GRAHAM & MATHERS, Pittsburgh, Pa., issue a sheet illustrating their Sliding Barn-Door Locks and giving three illustrations, one of which represents the outward appearance of the Lock, another its inside construction and the third the flush cup handle for outside of door.

SPRINGFIELD ARCHITECTURAL IRON WORKS, Springfield, Ohio: General Catalogue, No. 26. This is a well-printed catalogue containing 79 large pages, and it is evident that its compilation involved considerable expense, and the work has been done with care. The large line of iron work manufactured is shown, together

with the Prince, Monitor and Surprise Lawn Mowers and the Shoulin Engine. The Springfield Architectural Iron Works are, it will be remembered, the successors of the Hanika Iron Fence Company and they ask the trade to bear in mind that they make everything in this general line, and that if what is wanted is not found in the catalogue, it should not be taken for granted that it is not manufactured by them.

THE COPELAND HARDWARE MFG. COMPANY, Worcester, Mass.: Catalogue and price-list of the Copeland Extension Dividers and Calipers and Hardware Speciales, including Ice Picks, Wire Cutters, Screw Drivers, Pliers, &c. Illustrations are also given in the latter portion of the catalogue of some goods which they do not manufacture, but orders for which they will be pleased to receive and fill.

ISAAC CHURCH Toledo, Ohio: Illustrated catalogue and price-list. Church's Perfect Expansion Case Bolt and Church's Patent Multiple Expansion Bolt are fully illustrated and described. A diagram is also given showing a few of the many uses to which an Expansion Case Bolt may be applied.

HARBER BROS. COMPANY, Bloomington, Ill.: Catalogue No. 21, descriptive of Farm Machinery, Portable, Traction and Stationary Engines, Wagons, Buggies, Binder Twine and Bicycles. This is a very handsome catalogue of 138 pages, covering an immense variety of farm specialties as indicated. The company are general agents for the Rock Island Plow Company, Wayne Works, Fish Bros. Wagon Company, the Common Sense Engine Company, Frick Company, Ashland Clover Huller Company, C. V. Taylor & Co. and the Joliet Stowbridge Company, who, combined, are manufacturers of nearly everything in the line of Agricultural Implements and Farming Tools. Attention is called to the significance of the number of this catalogue, which is 21. Just 21 years ago the heads of this company first engaged in the business of handling farm machinery and allied articles and have remained in it continually since. During the past year they erected a large warehouse, office and repository building 54 x 180 feet, consisting of five stories and a basement, fitted with steam heating, powerful electric elevator, &c., with the benefit of an independent side track, so that they now have facilities for handling large quantities of goods promptly and economically. A cut of the new building appears on the back page of the cover of the catalogue.

WHITMAN & BARNES MFG. COMPANY, Cincinnati, Ohio: Mower Knives, Reaper Sickles, Mower Sections, Mower Guards, Spring Keys and Cotters, Twist Drills, Threshing Machine Teeth, Sulky Rake Teeth, Machine Repairs, Plow Repairs, Binder Twines, Binder Covers and other agricultural supplies. Their 1892 catalogue of 80 pages is well arranged, printed on a fine quality of paper and fully illustrates the goods above mentioned. List prices are given, and the alphabetical index at the back of the book adds to its convenience as a book of reference.

L. D. BERGER, 224 Arch street, Philadelphia, Pa.: Tinnery Hardware, Plumbers' and Roofers' Supplies, Gray and Malleable Castings made to order, Pattern Making, Turning and Japanning. His 1892 catalogue gives illustrations and prices of Tinnery Trimmings, Hinge, Wood and Brick Hooks, Gas-Pipe Hooks, Eave Trough Hangers, Eave Trough, Box Gutters, Ridgings, &c.

THE GILBERT & BENNETT MFG. COMPANY, Chicago and New York: Catalogue No. 122, which represents a complete line of Fencing and Fencing Material, with illustrations, list prices and descriptive matter. It is to be noted that the list on World's Web Fencing has been reduced, while the discount remains the same, thus making the cost to the purchaser considerably less than formerly.



THE ABOVE is a reproduction in facsimile, though reduced in size, of the front cover of a pamphlet issued by Sargent & Co., New York, and New Haven, Conn. The company refer to this little pamphlet as containing everything in Hardware necessary for making and putting together Screen Doors and Screen

Windows, for opening and closing them properly, and keeping them shut when desired. Illustrations and prices are given of Door Checks, Screen Brackets, Spring Hinges, Door Springs, Screen Door Catches, Door Pulls, Screen Wire Cloth, &c. Attention is called to the fact that the demand for these goods is very great at this season of the year, and the suggestion is made that orders should be sent early to secure prompt shipment. The pamphlet comes as a timely reminder of a line of goods which has grown to be an important one, embodying as it does much valuable information in a compact and convenient form.

It Is Reported—

That Logan & Whaley, Marshall, Texas, have sold their Hardware business to a new firm under the style of T. J. Whaley & Son.

That O. M. Pate & Co.'s Hardware store at Sulphur Springs, Texas, was burglarized on the 15th ult.

That articles have been filed incorporating the Hardware firm of Rudge & Morris, Omaha, Neb.

That Charles Wood is erecting a new Hardware store at Long Tree, Iowa.

That Albert Theissen has been taken in as partner in the Hardware business heretofore conducted by Mr. Weiss at Mankato, Minn. The firm style will in future be Weiss & Theissen.

That James Smith and H. C. Blenis have commenced the Hardware business at Superior, Wis.

That Alfred and John Kochensperger are opening up a new Hardware store at Thornville, Ohio.

That C. H. Fee & Co., Hardware dealers, Cisco, Texas, are putting up a stone business house, which, when completed, will be the handsomest building in the town.

That burglars entered G. G. Golding's Hardware store at Alvarado, Texas, on the 21st ult., and purloined three large double-barrel breech-loading Guns, one Target Rifle and several pairs of large Scissors.

That Henry Diehl of Reading, Pa., intends removing to Philadelphia, where he will enter the Hardware business.

That J. L. Leatsch has commenced the Agricultural Implement business at Altamont, Ill.

That Christie B. Briggs, who has been employed for some time past by Hall & Wise of Penn Yan, N. Y., has pur-

chased the Hardware business of Woodruff & Wixson, and will take possession April 1.

That J. Riggs, dealer in Hardware, Joy, Ill., was recently damaged by fire.

That H. E. Vogt & Co. are a new Implement firm at Tinley Park, Ill.

That Benzel & Aldenhagen, Bedford, Ind., have dissolved partnership. The Implement business will hereafter be carried on under the firm name of Aldenhagen & Hartman.

That F. B. Gleason & Co., Whitman, Mass., have sold out their Hardware business to E. C. Howard.

Exports.

SUPPLEMENTARY SHIPMENTS PER BARK MARY HASBROUCK, FEBRUARY 10, 1892, FOR AUCKLAND, NEW ZEALAND.

By the F. B. Wheeler Company.—3 cases Hardware.

By Arnold, Cheney & Co.—25 cases Axes and Handles.

FOR WELLINGTON.

By H. W. Peabody & Co.—15 packages Hardware, 6 cases Lampware, 21 packages Hardware, 1 case Air Guns, 20 packages Lawn Mowers, 1 case Plated Ware, 4 cases Tools, 1 case Tinware, 1 case Forks, 2 packages Lampware, 9 cases Horse Nails, 1 package Pump, 2 cases Picks, 4 cases Axes and Springs, 1 case Plated Ware, 5 packages Lawn Mowers.

By W. H. Crossman & Bro.—4 cases Agricultural Implements, 10 kegs Nails, 11 packages Camp Goods, 1 case Hatchets, 14 cases Scales, 1 case Hoes, 1 case Blocks, 1 case Lanterns, 1 case Brushes, 32 cases Hardware.

PER SHIP LISMORE, FEBRUARY 16, 1892, FOR MELBOURNE, AUSTRALIA.

By Edward Miller & Co.—28 packages Lamp Goods.

By Meriden Britannia Company.—22 packages Plated Ware.

By Winchester Repeating Arms Company.—69 cases Cartridges.

By Edward Miller & Co.—57 packages and 7 boxes Lamp Goods.

By J. A. Babcock & Co.—12 cases Plated Ware.

By Peck, Stow & Wilcox Company.—4 boxes Hardware.

By Meriden Britannia Company.—3 packages Silver Ware.

By Sargent & Co.—28 cases Hardware.

By Meriden Britannia Company.—8 packages Silver Ware.

By Union Nut Company.—4 cases Iron Bolts.

By Atlas Tack Company.—5 cases Nails.

By R. H. Dana & Co.—4 cases Wrenches, 2 cases Saws, 2 cases Axes, 1 case Planes, 13 cases Axes, 2 cases Lamps.

By Hammacher & Delius.—2 cases Axe Handles, 1 case Hatchets, 1 case Hardware, 7 crates Stoves.

By Meriden Britannia Company.—3 packages Silver Ware.

By Alfred Field & Co.—9 cases Bolts, 1 case Bits, 2 cases Rivets, 3 cases Bolts, 1 case Nails.

By R. W. Forbes & Son.—3 cases Hardware, 10 packages Carriage Hardware.

By H. H. Moore.—7 cases Nails.

By Australasian-American Shipping Company.—7 cases Axes, 10 cases Paper Cutters,

8 cases Axles, 161 cases Axes and Hatchets.

By Alfred Field & Co.—1 case Auger Bits, 2 cases Iron Rivets, 1 case Nails, 12 cases Carriage Bolts, 1 case Nails, 1 case Anti-Rattlers, 50 cases Staples.

By Arkell & Douglas.—2 cases Tinware, 10 cases Rakes and Hoes, 1 case Scales, 22 packages Agricultural Implements, 2 cases Traps, 2 cases Bolts, 600 reels Barb Wire, 2 cases Plated Ware, 7 cases Lawn Mowers, 51 cases Nails, 70 kegs Nails, 44 cases Hardware, 8 cases Choppers, 31 cases Wringers, 307 cases Axes, 4 cases Lampware.

By W. H. Crossman & Bro.—1/2 dozen Jacks, 13 cases Hardware, 7 packages Plated Ware, 2 cases Plated Ware, 1 case Rakes, 1 case Toy Banks, 7 cases Lawn Mowers, 2 cases Hatchets, 15 cases Tacks, 40 cases Axes, 12 cases Hardware, 1 case Traps, 1 case Forks, 10 cases Wringers, 1 case Straps, 15 cases Nails, 227 cases Axes, 2 packages Pumps, 3 cases Tacks, 43 packages Hardware, 4 cases Hardware, 13 cases Lanterns, 6 crates Jacks, 4 packages Pump parts, 1 case Forks, 12 cases Iron Nails, 1 case Razor Straps, 3 cases Drills, 20 cases Hardware.

PER BRIG HAVILAH, FEBRUARY 17, 1892,
FOR CAPE TOWN, SOUTH AFRICA.

By Winchester Repeating Arms Company.—2 cases Cartridges.

By W. H. Crossman & Bro.—2 packages Hardware, 1 bale Manila Cordage, 12 cases Hardware.

By Arkell & Douglas.—1 cases Traps.

By H. W. Peabody & Co.—40 cases Tools, 1 case Pumps, 1 case Smaths, 20 cases Farming Implements.

By W. B. Fox & Bro.—6 cases Tools, 5 cases Hardware, 7 cases Lawn Mowers and Handles.

By Sherman & Lyon.—2 cases Fire Arms, 1 case Gun Cleaning Implements, 41 cases Metallic Cartridges, 4 cases Shelf Brackets, 1 case Meat Cutters, 108 Wheelbarrows, 12 cases Lawn Mowers, 9 barrels Lamp Goods, 10 cases Axes.

By Strong & Trowbridge.—80 kegs Nails, 18 cases Axes and Hatchets, 1 case Locks, 3 cases Axes.

PER BARK SAMAR, FEBRUARY 19, 1892, FOR SYDNEY, N. S. W.

By the Atlas Tack Corporation.—14 boxes Tacks, 11 boxes Nails, 15 boxes Tacks, 65 boxes Nails.

By Hartley & Graham.—42 cases Cartridges, 5 cases Empty Cartridge Shells, 1 case Rifles, &c.

By the Winchester Repeating Arms Company.—10 cases Guns.

By the Wilcox Silver Plate Company.—5 cases Plated Ware.

By Edward Miller & Co.—10 packages Lamp Goods.

By R. H. Dana & Co.—2 barrels Emery Wheels, 4 cases Plated Ware.

By A. S. Lascelles & Co.—2 cases Locks, 1 case Traps, 1 case Razor Straps, 4 cases Wrenches, 1 case Tills, 1 case Oilers.

By F. B. Wheeler Company.—34 cases Axes, 1 case Hardware, 48 packages Nails, 17 cases Wringers.

By Coombs, Crosby & Eddy Company.—3 cases Pumps, 1 case Adzes, 30 cases Tools, 4 cases Bird Cages, 3 cases Tools.

By McLean Bros. & Rigg.—83 cases Guns and Cartridges, 1 case Locks, 6 cases Lanterns, 1 barrel Bells, 4 cases Rat Traps, 1 barrel Braces, 11 cases Choppers, 1 case Hammers, 1 case Levels, 5 cases Wire Goods, 1 case Transom Lifters, 16 cases Hatchets, 2 cases Rat Traps, 2 cases Cork Pullers, 10 cases Bush Hooks, 1 case Saw Sets, 2 cases Cartridges, 40 cases Axes, 7 cases Hardware, 7 crates Churns, 1 case Belt Studs.

By Strong & Trowbridge.—40 cases Axes, 1 case Hammers, 1 bundle Hoes, 1 case Hardware, 1 case Wagon Jacks, 9 cases Axes and Hatchets, 4 cases Lanterns, 1 case Tacks, 2 cases Rivets, 4 cases Saws, 2 packages Plated Ware, 1 case Hardware.

By R. W. Forbes & Son.—18 cases Cork Pulleys, 15 cases Corn Shellers, 2 cases Carriage Hardware.

By W. K. Freeman.—4 cases Hardware, 1 case Saws, 10 packages Hardware.

By Healy & Earl.—2 cases Emery Wheels, 5 cases Pulleys.

By R. W. Cameron & Co.—2 kegs Nails.

By H. W. Peabody & Co.—5 cases Hardware, 12 cases Lanterns, 1 case Lamp Goods, 6 cases Hardware, 10 cases Nails, 23 packages Hardware, 1 package Lamp Goods, 7 cases Tacks, 7 packages Hardware, 1 box Tinware, 20 packages Hardware, 2 cases Wringer, 20 cases Edge Tools, 1 case Ferrules, 8 cases Hardware, 1 case Traps.

By W. H. Crossman & Bro.—1 case Guns and Reloading Tools, 1 case Primers, 3 cases Metallic Cartridges, 13 boxes Hatchets, 1 case Soldering Irons, 32 boxes Axes, 6 cases Metallic Cartridges, 1 case Rifles, 5 boxes Bush Hooks, 1 box Adzes, 3 packages Grindstone Fixtures, 1 case Transom Lifters, 1 case Cow Bells, 10 packages Hardware, 6 boxes Hatchets, 8 cases Hardware, 5 packages Lamp Goods, 6 packages Builders' Hardware, 4 dozen Wringers, 2 cases Hardware, ½ dozen Corn Shellers, 3 dozen Tills, 1 gross Lawn Sprinklers, 4 dozen Pumps, 3 gross Traps, 7 packages Plated Ware, 9 dozen Oil Stoves, 46 dozen Hatchets, 2½ dozen Wrenches, 30 dozen Picks.

FOR NEWCASTLE.

By W. H. Crossman & Bro.—9 cases Iron Bolts, 3 crates Traps, 3 cases Wringers.

By H. W. Peabody & Co.—3 cases Hardware, 12 crates Churns, 7 packages Hardware, 1 dozen Wringers, 1 case Stepladders, 2 cases Lamp Ware, 10 cases Builders' Hardware, 1 dozen Money Drawers, 7 cases Builders' Hardware.

Paints and Colors.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

Unfavorable weather conditions have been more or less of a barrier to business

in nearly all lines of Paints and Colors, and the general movement of goods has proven unsatisfactory to both manufacturers and jobbers. In this city and immediate vicinity the distribution seems to have been particularly disappointing, but the unavoidable experience has been aggravated by absence of any turn for the better in the run of orders from outside points. Salesmen who devote particular attention to Southern territory, in which adverse weather conditions are less pronounced than in this section of the country, do not appear to have turned in the usual quota of early spring season orders, at all events, and those who cover other territory have made a very indifferent record as well. As regards new features bearing upon values, there is absolutely nothing to note. The position of the market for base materials is practically the same at the present time as it was at the beginning of the month; competition runs along in about the usual lines and the general tendency seems to be toward conservative action pending developments in one direction or another rather than in the direction of aggressive action.

White Lead.—The distribution by corrodors does not appear to have been quite as free the past week as it was during the early portion of the month, and, outside of fairly liberal deliveries in execution of former orders, a rather slow movement has to go on record. Manufacturers of mixed Leads have had a somewhat similar experience, being affected by the same influences that corrodors have had to contend against and enjoying no special advantages in any direction. Prices remain stationary, and, while the level of value of Pig Lead has been somewhat lower, there is no evidence of apprehension of reduction in rates for any class of pigment. The matter of prices, as a matter of fact, seems to be a secondary consideration with buyers now that the spring season is somewhat advanced.

Red Lead, Litharge, &c.—For the cheaper class of material used by Glass manufacturers there has been a very fair demand, but the higher grade product adapted to the Paint trade has moved out in limited quantities only, and the former line of prices is adhered to. Orange Mineral is steady at former quotations for both domestic and foreign brands, but momentarily finding rather slow sale.

Zincs.—New orders for American Oxide have been on a moderate scale, hardly up to the average for the season, in fact, but the current production is closely taken up by deliveries on former contracts and nothing has occurred to disturb the amicable relations between manufacturers that have existed for some time past. Prices therefore remain very steady. Foreign brands are brought this way only as well-defined wants may direct, and importers make no change in their prices.

Colors.—For leading lines of Blues and Reds there has been a very fair demand, and Greens have fared nearly as well, but in neither those or other dry Colors does the movement appear to contrast remarkably with what is customary at this season, and prices show only unimportant movement. Regarding Oil Colors, practically the same report is to be made, little or no influence being felt from the change that has taken place latterly in the Linseed-Oil market. As yet no interest in Paris Green or other insecticides is manifested by jobbers in any quarter.

Miscellaneous.—Some orders are being placed for Barytes for near future delivery, but the movement is not sufficient to affect values. China Clay, Terra Alba and Talc have met with very fair sale at full prices. Block Chalk is irregular in price, with spot parcels selling at \$1.37½ and even less ex-steamer. Whiting just about holds its own in price, although selling rather slowly.

Oils and Turpentine.

In the way of distinctively new feature there is nothing to report for the past week. The upward movement in Linseed Oil prices appears to have ceased, temporarily at least, and no further weakness in Cotton Seed or Lard Oils is visible, although the tendency of both seems still to be more or less in buyers' favor. Business in all branches of the market has been rather slow, disappointing, in fact, and contrasts somewhat unfavorably with that of the preceding week. No new features have come to the surface except a fall in prices of Lard and inferior greases that have a sort of superficial bearing upon certain lines of lubricants and that change is without visible effect upon the movement of the goods. Turpentine is still irregular, being affected more or less by Southern speculation.

Linseed Oil.—Although of very fair volume, business has been hardly as brisk as it was last week. The smaller movement is attributed in part to weather conditions, that have had an unfavorable influence upon consumption by painters, but it is patent that consumers generally are inclined to a very conservative course pending more definite information as to the nature of the agreement, if any, under which out-of-town crushers are working. As matters stand 37¢ less 2½% is quoted for Western in carload lots, and 37¢ net in smaller quantities, but some outside brands, it is stated, may yet be secured at a shade less by close buyers. City crushers have kept their figures at 38¢ for domestic and 56¢ for Calcutta seed product.

Cotton-Seed Oil.—The market for both crude and refined product has remained positively flat. Export orders continue very light and European advices are without the least encouragement. The home trade demand drags wearily also, and about the only obstacle in the way of buyers gaining a decided advantage is the considerable amount of Oil that quietly goes to large consumers for manufacture of Lard compounds and substitutes. As it is, prices hold fairly steady in the face of rather heavier receipts here and the extreme indifference of most buyers. Sales the past week have been chiefly at 24½¢ for prime quality crude and 28½¢ for prime Summer Yellow. In a few instances about ½¢ more was obtained for Oil of exceptionally fine quality.

Lard Oil.—Although weakness in the market for raw material has had a tendency to cause buyers to hold back in anticipation of lower prices, pressers have thus far made no positive concession, since a good portion of their current output is taken up on back orders. The tone of the market is rather weak, however, and there are faint indications that orders for good-sized lots of Oil for delivery some little time ahead would be taken on special terms.

Fish Oils.—There is not the slightest change in the market for crude Sperm, Whale or Menhaden Oils apart from the reported return of upward of 1000 bbls. of Menhaden by the "combine" to meet home trade needs, part of which is said to have been sold at 31¢. In the manufactured goods there is about the average jobbing trade at steady prices.

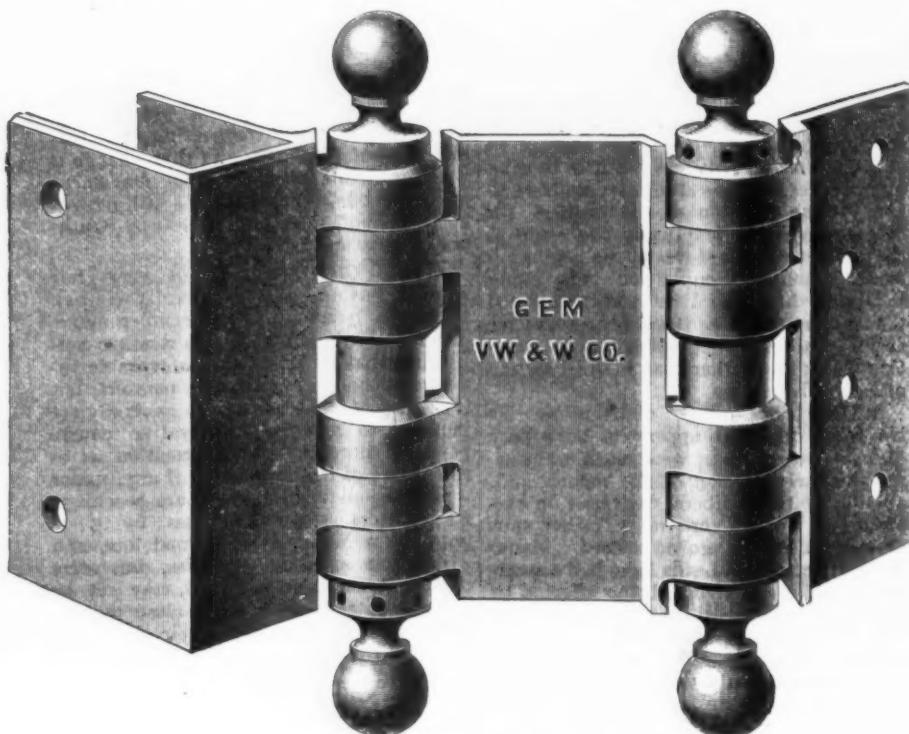
Spirits Turpentine.—Prices have ruled irregular under the influence of Southern speculation and some movement of similar character here, and the market is still in uncertain shape. During the week business was done at as low as 36 @ 36½¢ here, as to style of package, but more recently an advance of 1½¢ has been established.

The *Locomotive* publishes in full an excellent illustrated lecture, delivered by J. M. Allen, president of the Hartford Steam Boiler Insurance Company, at Sibley College, Cornell University.

Double-Action Gem Spring Hinge.

Van Wagoner & Williams Company, New York, are offering the trade a modified form of their regular Gem Hinge, as shown in the accompanying illustration. The leaf shown on the left hand of the cut is designed to straddle a $1\frac{1}{2}$ inch marble slab; the opposite leaf is to be fastened to

case and to the depth required. The case with nut is then placed in the hole. The work to be fastened is put in place and the bolt is put through it into the case. It is then screwed up until the desired tension is obtained, thus making, it is claimed, a very secure fastening. This bolt is referred to as having a perfect expansion. It fills the hole perfectly, as it

*Double-Action Gem Spring Hinge.*

the water closet door. These hinges are for use in buildings where the partitions between closets are of marble; or in buildings where doors are to be hung to marble partitions. Regular patterns of these goods are made $3\frac{1}{2}$ and 4 inches long, finished in bronze, brass, nickel, old copper, &c.

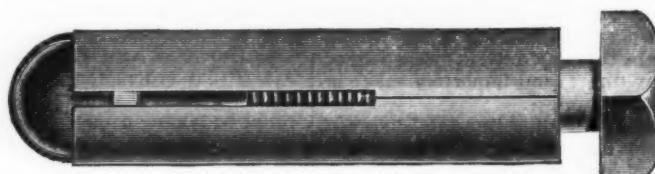
Improved Expansion Bolt.

The above device is represented in the accompanying illustrations, Figs. 1 and 2, the latter giving a sectional view. It is manufactured by Isaac Church, Toledo, Ohio. It is intended for fastening all kinds of structures to stone, brick or

expands in all directions from the center to the surface, bringing all parts of the surface of the case in contact with the sides of the hole, giving, it is claimed, the largest amount of frictional contact that can be produced. It will be observed that the case reinforces the nut and the contact with the sides of the hole reinforces the case, making a fastening of exceptional strength. It will also be seen by reference to the sectional cut that the nut is inclosed within the case and cannot thus be displaced or lost.

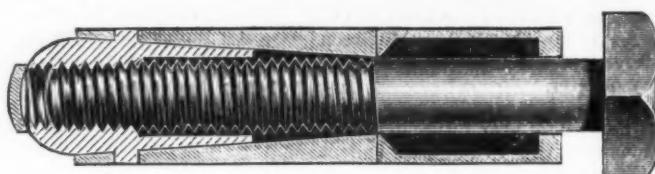
Boston Electric Wire Cutter.

H. K. Porter, 66 Beverly street, Boston, Mass., is offering this article, as illustrated

*Fig. 1.—Improved Expansion Bolt.*

cement work. The case and nut are described as constructed of the best quality of malleable iron, and the bolt of the best

herewith. This is an adaptation of the Easy Bolt Clipper, the long part of the handles being the same, but the outside of

*Fig. 2.—Sectional View of Bolt.*

grade of refined iron. In applying the bolt a hole is drilled in the stone, brick or cement a little larger than the outside of the

adjusting section has a neck just behind the joint which attaches to the cutting jaws, causing the cutting edges to open

wider. It is stated the cutter will take in $\frac{1}{2}$ -inch wire between the cutting edges easily, and with a little crowding will take a $\frac{3}{4}$ -inch wire, as the insulating covering on electric wire is not very hard. It is also stated that it will cut off a $\frac{1}{8}$ -inch copper wire and any stranded cable conductor that can be got between the jaws. The handles are covered with the best non-conducting quality of rubber, or not covered, as desired, as for factory work it is sometimes not needed, but for cutting wires carrying a current it is necessary to have them covered. As shown in the cut, the cutter is made for the use of firemen, has an automatic hook for finding the wires, or for catching hold of them quickly, either day or night. For electric light or railroad work, it is explained, the hook is not needed. In the cut the double-ended hook is shown swung to the left as far as it will go, but it will also swing an equal distance to the right, and in either position when the cutting jaws are opened, the edge of the jaw on the side the hook is swung to will be just even with the side of the hook. The hook thus forms a perfect

*Boston Electric Wire Cutter.*

guide to guide the jaws to the wire. In operating the handles are always opened to their full extent, which will also open the jaws. When the wire has been caught under the hook it is then only necessary to push the cutter slightly toward the wire, when the latter will enter between the jaws, and it can be cut off in an instant. It is pointed out that it makes no difference which side or edge of the cutter happens to strike the wire, as the double-ended hook will swing either way and guide the wire between the jaws equally well, and for the same reason, the operator need pay no attention to which way he holds the cutter. The point is made that this is not a shear, but a cutting nipper, biting the wire off, and that it weighs only 5 pounds, and is 26 inches long, being as light and small as is consistent with the required strength.

It is said that at Sheffield no orders for table cutlery or knife blades have been received from this country for some time.

The Greyhound High-Wheel Lawn Mower.

This mower is just being put on the market by the Thomas Mfg. Company, Springfield, Ohio, and is represented here-

state that the wheels and reel are made the proper size and correctly proportioned to each other, so as to make the draft light, and the mower thus runs readily and easily. The height of grass which the mower will cut and its varied adjustment



The Greyhound High-Wheel Lawn Mower.

with. The Greyhound is adapted to all kinds of work, terraces, &c. It has a front rod to protect shrubbery, trees, &c. The manufacturers refer to the clutch as

are also specially mentioned. The mower is described as constructed largely of steel and malleable iron, having cutter bar extra strong, tempered in oil, and floating

The Thoroughbred Phoenix.

Stover Bicycle Mfg. Company, Freeport, Ill., are introducing the Thoroughbred Phoenix, a new cycle for 1892, as illustrated herewith.

To fill a demand for a light bicycle, geared high for road scoring and racing purposes, the Thoroughbred has been brought out, which, it is stated, is what its name implies—a fast, rigid, light and strong bicycle. It is made without mud guards or brake, is fitted with dropped bars, light saddle, rat-trap pedals, pneumatic or cushion tires, and geared to 54, 57 or 60 inches, at the option of the purchaser. It is stated that the gear can be changed at any time, and that the rider can have two or more gears if he wishes at a small cost. The rear sprocket may be easily removed and a new one substituted. This advantage, together with their hardened chain, is referred to as making the machine well-nigh indestructible. The saddle is set well back, the handles are low, and it is stated that the machine is capable of great speed. It is built in two sizes, 28 or 30 inch wheels. The 28-inch wheel machine with cushion tires weighs all on 34½ pounds, the 30-inch machine weighs 2 pounds more. With pneumatic tires the machine will weigh a little less in either size. The manufacturers state that, although they are not partial to light machines, they are satisfied that no better or stronger machine, weighing the same, could be made.

The Philadelphia *Telegraph* quotes from the report of Sir Horace Rumbold, to the British Royal Commission, the condition of laborers in Holland, as follows: "At times barely earning enough to support themselves and those who depend upon them, or loitering about under an inclement sky in search of work often snatched from them by competition from outside; at intervals kept day and night to their task, and only the shortest of breaks allowed them for rest or food; under the best of circumstances working 12 hours or



The Thoroughbred Phoenix.

positive, absolutely catching at any and all points, with either or both wheels in operation. The simplicity of the pawls and gearing and their strength and durability are also referred to. The company

cutting apparatus and shelf-sharpening knives. It is handsomely finished and is made with four knives, 6-inch open reel and 9-inch wheels and with 14, 16, 18 and 20 inch cut.

14 hours a day, and, in accordance with what seems to be the more general custom, being given barely sufficient time to get their midday meal in anything like comfort."

The Florence Lawn Mower.

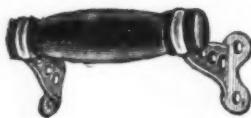
The G. S. Foos Company, Springfield, Ohio, are introducing this mower, as illustrated herewith. The driving mechanism consists of two 8-inch drive wheels, into

*The Florence Lawn Mower.*

which are cast the teeth, which operate on the reel shaft pinion, and which, it is stated, are made extra heavy to prevent breakages. The reel shaft pinion is referred to as revolving loosely upon the shaft, and having upon its inner face projecting lugs, which in turn drive direct-acting pawls inclosed within a ratchet housing attached to the reel shaft. This combination makes, it is stated, a positive force clutch quick in action. The reel is mounted on a shaft of cold-rolled steel, with malleable "spiders" (or arms), to which knives of oil-tempered tool steel are firmly attached. The cutting bar of hardened tool steel, oil tempered, is so pivoted, it is stated, that the edge of the knife only is presented to the grass. The connecting bar is a single piece of $\frac{1}{2}$ cold-rolled steel, and the malleable-iron roller brackets have an adjustment of from $\frac{1}{2}$ to $1\frac{1}{2}$ inches above the ground. It is stated that the workmanship and finish are the best that money and skilled labor can produce on a machine of this class.

Royal Wash Boiler Handle.

Haslet, Flanagan & Co. of 116 North Second street, Philadelphia, Pa., in the manufacture of their wash boilers make use of the handle which is illustrated in the accompanying cut, and the manufacturers state that they are giving the trade the advantage of this improvement without additional cost. The shanks of the handle are said to be made of best charcoal

*The Royal Wash Boiler Handle.*

malleable iron, warranted not to break. The shape of the handles is such as to readily fit the hand, while adding greatly to the general appearance of the boiler in connection with which they are used. We understand that the handles can be obtained separately when desired and can be readily placed upon any boiler.

Gales' Diamond Model A.

Schooverling, Daly & Gales, 302 Broadway, New York, are introducing the above machine for 1892. The manufacturers state that while the '90 and '91

heads and pedals. The frame is described as of best weldless steel tubing, with handle bar bent to the most comfortable shape, cranks keyed on, geared to 56 inches, and having the saddle and handle bars adjustable. The spoon brake is applied to the front wheel. In finish the wheel is beautifully enameled, the bright parts highly nickelized on copper and supplied with Garford saddle, tool bag, wrench and oiler. The cycle is also fitted with pneumatic tires.

Musical Attachment for Cycles.

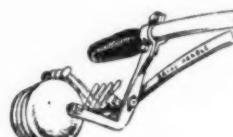
A recent issue of the London *Ironmonger* contains a description of the novelty illustrated herewith. The device is put on the market by H. C. Lawlor, Ballymoney, England, and consists of a neat arrangement of a number of small bells, tuned to scale, with corresponding spring keynotes, attachable by a light screw clamp to the handle bars. The engraving shows the arrangement of the eight bells of an octave, four on each handle. The keynotes being set at a suitable distance from the hand, the rider is enabled to manipulate them with his fingers quite easily. By special arrangement sets of bells to play in harmony can be supplied for the use of clubs, and, with a little practice, some excellent effects may thus be produced. Even with a single octave a rider has an opportunity of relieving the monotony of a solitary ride in an agreeable manner.

*Gales' Diamond Model A.*

forged steel and using the highest grade of English tubing. The chain adjustment is referred to as being new, easy to manage, and as being impossible for it to get out of parallel. The wheels are 30 inches

The apparatus is of trifling weight and offered at a moderate price.

A syndicate is reported to have purchased at the price of \$2,800,000 the El-

*Musical Attachment for Cycles.*

front and 28 inches rear, with direct spokes and $1\frac{1}{2}$ -inch cushion tires. There are ball bearings to all parts, including

mira water works, gas works, electric light plant, three railroads and International State Fair Association properties.

The Christy Bread Knife.

The novelty illustrated herewith is put on the market by the Christy Knife Company, Fremont, Ohio. The company state that the patent on this knife covers the handle and the manner of its attachment to the blade and the form of the cutting edge. The edge, it will be observed, consists of a series of reflex curves ground on one side only in such a manner that the entire edge and not the teeth alone is uniformly sharpened. This form of edge is referred to as possessing many advantages, among which its cutting qualities and the

broken or bituminous coal and similar lumpy materials. The spar projection, which is of steel and riveted to the blade, greatly facilitates the filling of the shovel by driving apart the material and thereby making way for the extended edge of the shovel blade. We are advised that it has been found especially advantageous for "breaking down" cargo in the hatchway of vessels, in discharging broken coal and other material, making the work less laborious and saving time. The manufacturers claim that the long-handled gravel or dirt shovel will keep its point until the body of the blade is worn out, and will

with the small roll directly or indirectly through the mop, five or six strokes of the lever being necessary to drive an ordinary mop cloth between the rolls. Wire guides are provided for keeping the cloth between the rolls, and it is stated that the entire act of wringing a mop can be performed easily without stooping. The weight of the machine complete is from 12 to 18 pounds, and the machine is fully guaranteed by the manufacturers.

*The Christy Bread Knife.*

facility with which it may be sharpened are especially pointed out. The knife may be sharpened on an ordinary whetstone or steel. The blade is described as made of solid steel of the finest quality. The knives are triple plated to prevent rusting. With this knife it is stated that hot bread can be sliced as well as cold bread, the operation being performed with neatness and without leaving crumbs. The steel handle will not soak off or become loose, and it is very convenient for hanging up the knife. The manufacturers state that if the knife is used only for the purpose for which it is intended it will retain its cutting edge for years. The company are also making a cake knife on the same principle, which is, of course, of smaller size.

Improvement in Shovels.

Hammer & Co., Bradford, Conn., have recently patented an improvement in

outlast three ordinary shovels. The manufacturers advise us that the shovels have been thoroughly tested. The improvement is the invention of T. F. Hammer of the above named firm.

The U. S. Mop Wringer.

Columbia Mfg. Company, Des Moines, Iowa, are introducing this article, as illustrated herewith. The base of the wringer is 12 x 15 inches in size, with uprights 4 inches wide and 16 inches high, all the wood work being $\frac{1}{2}$ inch thick. It is made of hard pine and maple, put together in a substantial manner. The two wooden rollers are of unequal size, the smaller one journaled to the front spring and actuated by foot power. The larger roll is journaled to the horizontal, slotted bars, which are mounted at one end on the journals of the small roll, and on the outer ends of the clamping lever. In use the rolls are separated by throwing the lever forward, the mop introduced, when the rolls are brought together by throwing

Coach Makers' Offset Jaw Vise.

Hollands Mfg. Company, Erie, Pa., among other vises, are putting on the market that shown in the accompanying

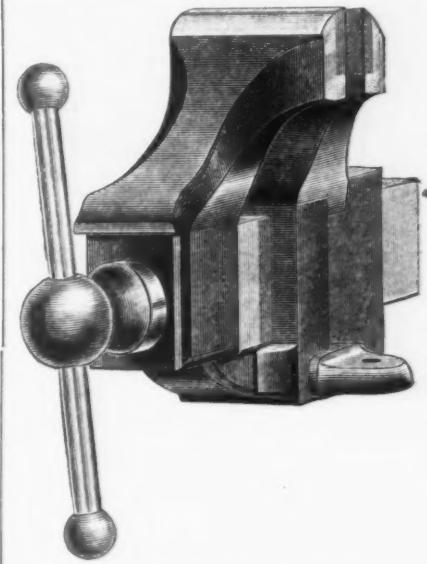
*Coach Makers' Offset Jaw Vise.*

illustration. This vise is made with 4½-inch width of jaw, opening 9 inches, and the manufacturers allude to it as possessing the same capacity for holding up-

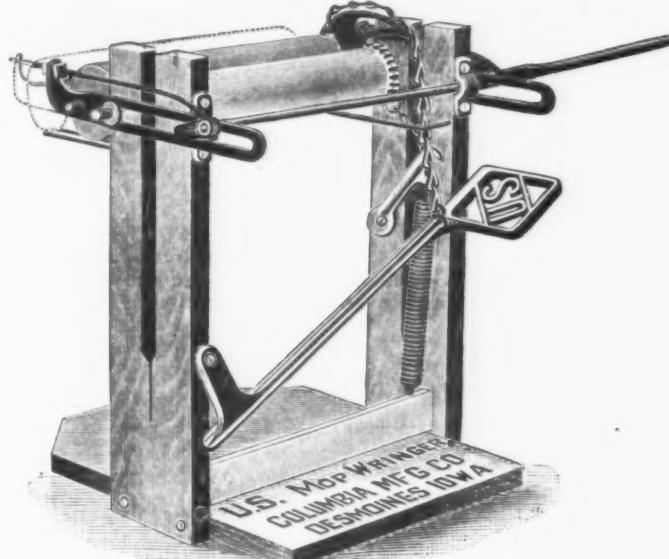
*Fig. 1.—Shovel.**Fig. 2.—Scoop.***Improvement in Shovels.**

shovels, illustrations of which are given herewith. The scoop represented is especially adapted for shoveling commercial

the lever backward, and automatically locked. By pressing the foot upon the treadle a half-revolution of the small roll is effected; and by releasing the pressure upon the treadle the coil spring causes the oscillating segment to return to its normal position, ready for a second stroke. The large roll is driven by friction by contact

right as the regular 8-inch jaw vise. It is described as made extra strong and well finished. The weight of the vise is 60 pounds.

The rubber men—that is, the dealers in caoutchouc—are reported to be negotiating for the forming of a combination or trust.

*The U. S. Mop Wringer.*

The Majestic.

Hulbert Bros. & Co., 26 West Twenty-third street, New York, are introducing a wheel of their own manufacture, as illustrated herewith. It is referred to as a strictly high-grade machine in construction, with nothing but the best of material used. Steel forgings and weldless steel tubing are used, and, it is stated, not 1 ounce of cast metal goes into the machine. It is described as having ball bearings at the head, both wheels, crank axle and pedals, and as hardened with the greatest care and ground to a nicety, thus giving perfect accuracy. It is stated that every part is made to a gauge and is interchangeable. The frame is of the true diamond shape, with long steering centers and wheel base, rear brake and Brampton-Humber chain. The wheels are two 28 inch, fitted with direct spokes, having

which it is claimed that the sod is not torn or the surface scuffed in turning corners.

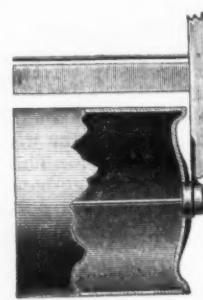


Fig. 2.—Showing Construction of Roller.

The ends of the cylinder are closed by two cast plates, whose edges are flush and even with the surface of the cylinder.



The Majestic.

brass nipples at the rim and enlarged butt threaded at the hub. The rims are referred to as being of the best cold-rolled steel. Both cushion and pneumatic tires are fitted to these machines, the cushion being $1\frac{1}{2}$ inch to both wheels and the pneumatic $1\frac{1}{4}$ inches to the front and 2 inches to the rear, both tires being of the latest and most desirable pattern. The weight of the wheel, all on, is 42 pounds. The manufacturers state that although the Majestic is strictly high grade, they propose to sell it at a popular price.

Model Lawn and Garden Roller.

Thompson Mfg. Company, Elkhart, Ind., are offering the above article, as

These plates have lugs on their inner surface that telescope into the cylinder from each end, with a stay rod, threaded on

together by screwing up the nut on the rod, thus compressing the filling. It is stated that when filled no noise is made when the roller is used, and that the joints are tight, thus preventing the escape of the filling. It is pointed out that the light construction of the roller enables the manufacturers to furnish a first-class steel roller at a popular price, with small cost for transportation.

Trouser Guard.

Hulbert Bros. & Co., 26 West Twenty-third street, New York, are putting this guard on the market, as illustrated here-with. It is made of spring steel, finely enameled, with a slot on one end to engage in the raised portions of the other end. It is adjustable to different sizes by a method so simple as to make this a prominent feature. The point is made that the guard



Fig. 2.—Trouser Guard Closed as in Use.

extends completely around the trousers, thus preventing a possibility of its slipping or becoming lost. When not in use on the outside of the trousers it may be clasped about the ankle out of sight, without discomfort to the wearer. The guard is designed for use in cycle riding.

Old Hickory Almanac.

Elliott Hickory Cycle Company, Newton, Mass., issue an almanac in which their Hickory cycles are brought prominently



Fig. 1.—Trouser Guard Open.

one end, which runs through the center of the cylinder and hub of each plate, holding them in position. The roller is designed

before the trade. It is hardly necessary to state that the humorous predominates. The signs of the Hickory zodiac are exceedingly pertinent and suggestive, although the compilers disclaim all responsibility for the appearance of the central figure, the man. The artist has been particularly happy in his selection of subjects used to illustrate the various tests to which the materials used in the Hickory are subjected, as well as in representing the stages through which the cycle passes in course of construction. For instance, the spokes are tested for strength by being bent over the knee of an old darkey; the rims are steamed in a wash boiler over an old cook stove, and are afterward bent around a barrel; the enamel is put on with pump and hose, and the entire cycle afterward carefully baked in the oven of a cook stove. These illustrations will serve to show the character of the pictures as they appear over the dates of each month. The almanac also contains description of the Hickory Cycle and of its parts in detail, setting forth its good points, improvements for 1892, and the advantages claimed for it over other wheels.

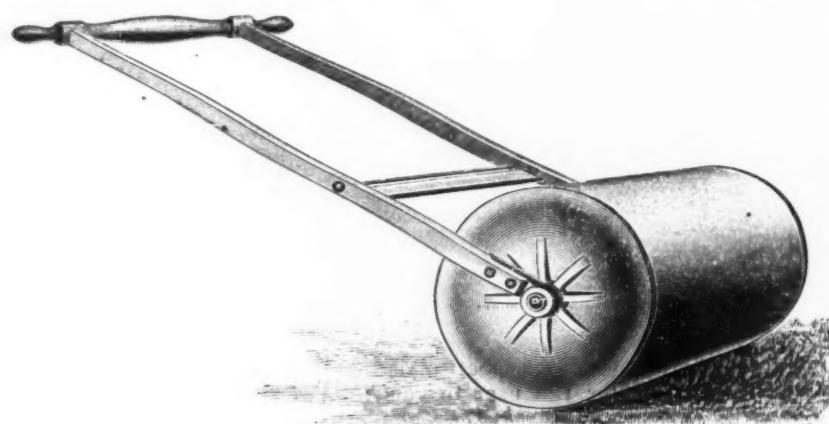


Fig. 1.—Model Lawn and Garden Roller.

illustrated in the accompanying engravings. The roller is a steel cylinder, perfectly smooth on the outside, in using

to be loaded by filling the cylinder with earth, gravel, mortar or other materials, after which the end plates are drawn

The Tourist.

The George R. Bidwell Cycle Company, 308 West Fifty-ninth street, New York, are introducing the above cycle, as illustrated herewith. The machine is built at Colt's West Armory, Hartford, Conn., and is submitted to the same critical inspection as the fire arms manufactured by the above concern. Each part of the cycle is constructed to gauges exact to $\frac{1}{1000}$ of an inch, this variation only being allowed in all the details.

In designing their 1892 pattern wheel they have followed the lines of the '91 Tourist in general, changing it, however, where such change would prove a distinct advantage.

The "True Diamond Frame" has been retained, but changed from the bolted to the non-detachable brazed style and tubes reinforced at each brazing, giving greatly increased strength and rigidity. The ball head has been lengthened and the

ing the removal or putting in of spokes, and is referred to as being about as simple as a direct spoke and yet having all the advantages of the tangent. The spokes are enlarged at both ends by the swaging process, the wire being drawn from the enlarged section to the required size. The nipple is of extra length, with ample square surface for wrench, and solid at the upper end, making it impossible to force the spoke beyond the face of the felloe into the tire. By using a nipple of extra length it is explained that they so increase the spoke adjustment as to render unnecessary the removal of the tire if a new spoke has to be put in.

The wheels are both 30 inches in diameter, fitted with 2-inch Thomas pneumatic tires of the latest and most improved form. The point is made that cones, bearing boxes and balls, gauged to the thousandth part of 1 inch, are not only perfectly free in action, but the decreased wear, owing to this construction, is an important factor when the life of a wheel

pedals all embody features peculiar to the Tourist. Particular emphasis is placed upon the desirable construction of the Thomas pneumatic tire as used on this machine, and the manufacturers earnestly recommend to their customers the pneumatic, although they are prepared to supply the Tourist with a large cushion tire on special orders.

With a view toward reducing the number of parts, they have used 4-inch balls throughout the wheel, save in the pedals; the cups or ball races in each wheel are interchangeable, which is also true of the set screws used in binding the seat-post clamp and the handle-bar clamp. In addition, it is stated that each bolt head and nut is tempered to a degree that makes it impossible to round the corners of the nuts or to twist off the bolts under any ordinary strain.

All bolts, nuts and screws, instead of being nickelized, will have what is known as the case-hardened finish, familiar on fine fire arms, where beauty and durability



The Tourist.

wheel base extended, while the tread is narrower than formerly.

Instead of using $\frac{1}{8}$ inch balls in the head the size has been increased to $\frac{1}{4}$ inch, making them less liable to breakage.

These improvements have been made with a view to further increase the present steady steering qualities of the Tourist, to equalize the distribution of the rider's weight on both wheels, which is referred to as an important factor when roads or pavements are wet and slippery, and also to render the rider's position, when in the saddle, more natural. The frame throughout is of the very best cold drawn weldless steel tubing, manufactured by the Shelby Steel Tool Company, Shelby, Ohio. We are informed that samples of this tubing stood a higher test at Colt's Armory than samples of the best English tubing.

The felloes are of best Swedish stock, thickened at the center to give additional rigidity, and are formed to a true circle, to insure an even tension on the spokes when the wheels are assembled. The felloes are held together by an interlocking device in addition to the brazing. The hubs are so constructed that tying of the spokes is dispensed with, thereby greatly facilitat-

is considered. In this connection they call attention to the fact that the crank hanger of the Tourist is so proportioned as to give exactly the same distance to the end of the crank shaft on either side of the frame to avoid putting an unequal strain on the frame and making the wheel practically one-sided.

The Abingdon-Humber pattern chain with 1-inch pitch is used, and is constructed under their own supervision. Every side link and center block is made to a standard test gauge. The center block is drilled and the chain riveted by special machinery, which, it is stated, does not admit of any variation, and when complete the chain will exactly fit the sprocket wheel and not "ride the sprockets." The front sprocket wheel is described as being made of aluminum silver-bronze, the rear sprocket of case-hardened gun steel of high carbon, and the chain of open hearth steel subjected to special treatment. The combination of these three metals is referred to as not only conducive to good wear, but also as reducing friction as a minimum.

The rear sprocket, the front sprocket and crank, the chain adjustments and

are essential. The frame and front fork will be in black enamel and special care will be exercised in preparing frames, that the surface may be perfectly smooth and free from all imperfections that cause enamel to flake off or peel. The nickel on the Tourist is known as "hard nickel," used on all fine revolvers, its special feature being that it will not become defaced or marred as easily as soft nickel—in fact, the manufacturers propose that in detail of construction and finish the Tourist shall excel all competitors.

KINNEY DISINFECTING COMPANY, 942 Champlain street, Detroit, Mich., are manufacturing a safety patent disinfectant chamber commode. This article is described as constructed on the most advanced scientific principles, and the point is made that when the contents of the commode are thrown into the sewer, it tends to purify the entire sewerage system and is a protection against all diseases that arise from sewerage. Testimonials are given in which the excellence of the commode is attested by physicians.

Well-Preserved Stock.

The hardware trader has little to fear from the burrowing moth, but he must be constantly on the watch that the rust doth not corrupt. A dry atmosphere is one of the most essential things to a hardware store, hence low-lying districts are to be avoided in choosing a site for a building in which to store hardware. A yawning, damp cavern beneath a store is also a serious drawback. In fact, there is no line carried by a hardwareman that it is absolutely necessary to have a cellar for. Oils, woodenware, tar, &c., can be kept in an outhouse quite as well as in a cellar. When there is no keeping out moist air there should be enough fire maintained in the stove to prevent the moisture distilling on the metallic goods. The draft of the stove will tend to exhaust the room of the aqueous vapor which the heat keeps rarefied. If dampness is not dispelled, the vapor in the air is certain to condense on the chill surfaces of the polished wares exposed to contact with it. The result

to the level of high prices. When he comes to offer his business for sale, if ever he concludes to do so, he will be able to get fair value for his stock. The impression which the condition of his stock will make upon the searching eye of the traveler, who is always expected to take notes for his house, will be useful to the trader, the purchasing power of whose money and the acceptability of whose

of small pieces slipping through the broilers is reduced, while the strength is also much increased. The broiler is thus exceptionally strong, and with the twisted handle presents a very neat appearance.

Walker's Cigar Box Opener.

Erie Specialty Mfg. Company, Erie, Pa., are manufacturing this article. An illus-



credit depend very much upon the pre-possessions which are formed of his store.

—Hardware, Toronto

The Vaterland Spade.

Terre Haute Shovel and Tool Company, Terre Haute, Ind., are manufacturing the above article, an illustration of which appears herewith. The material used in the

tration of the opener is given herewith, the cut representing it half size. The width of the device gives a good grip for twisting open the box. The position of the hammer is such that it prevents the knife edge from going into the box and tearing the fly leaf or damaging the cigars. The opener is described as finely nickel plated and is $3 \times \frac{1}{2}$ inches in size, thus giving large display for an advertisement,



The Vaterland Spade.

will be the formation of a metallic oxide, and an unsightly rust mark will show where the moisture gathered and the union between its oxygen and the metal took place. The goods so defiled by the touch of moisture are damaged, and will bring usually only the prices of second-hand goods.

The hardwareman whose store is in a damp situation is seriously handicapped. His stock will depreciate or the cost of dissipating the moisture will be a considerable item of expense. After all is done to keep a dry atmosphere in the store, well-wrapped packages, tight showcases and close drawers are necessary in the most sultry situations. Here is where work comes in for the shop keeper. He has to overhaul his goods frequently and thoroughly to detect the presence of rust in any of them. He has to rub with a bit of chamois every bright surface contaminated in the course of business by the touch of the breath of people who are choosing one thing from among many. Such goods as have to be seen before purchase, and which can be typified by one example, should be kept closed up always, with a specimen on exhibition in a glass case. Samples are expected to deteriorate in value, but it is not necessary that they should become worthless through the neglect of the shop keeper. A little sweet oil, a little rubbing up with chamois, will often redeem a badly tarnished article, and make it presentable by the side of wares which have not so suffered. Such lines as cannot be worked up to their old appearance should be promptly put among the bargain goods, and given every opportunity to make their way into sale. The pushing of bargains is the means of ventilating stock and keeping it fresh, as such pushing affords a healthy outlet for all goods that tend to decline into trash.

The care of goods, the prompt reduction for blemishes in appearance and the keeping of bargains in the foreground go hand in hand in the policy and course of a live shop keeper. He is vigilant in looking after his stock to prevent deterioration through rust, shelf-wear, and the tendency of invention to make back numbers too rapidly of all specialties. Such effects of this description as he cannot keep out he will not allow to accumulate, and will run off by low prices what he cannot keep up

production of this spade is described as of the highest grade, and every tool is warranted. The cutting edges being angular no steps are required, the absence of which is referred to as allowing the blade to scour perfectly from end to end. The spades are made with either T handle or a 36-inch D handle, as preferred by the party ordering. They are packed in boxes of half dozen each.

New Steel Hinge Broiler.

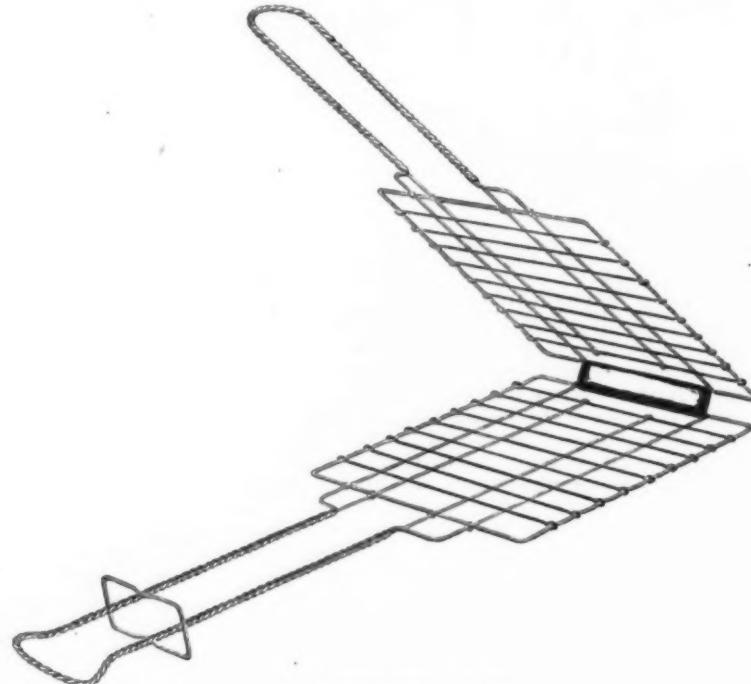
This article has recently been placed on the market by Hamblin & Russell Mfg. Company, Worcester, Mass. An illustra-

which is put on without charge when the openers are ordered in large quantities.

Automatic Closing Fire Doors.

The Victor Mfg. Company, Newburyport, Mass., are offering fixtures for fire doors which are automatic in their workings and also in conformity with the requirements of fire insurance companies. It is stated in a circular issued by this company that the only reliable fire door is made of wood covered with tin.

Such a door is hung with wrought-steel anti-friction hangers, of the barn-door



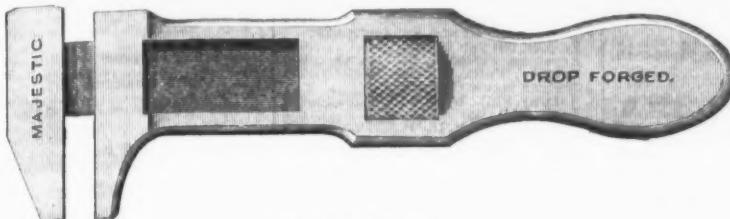
New Steel Hinge Broiler.

tion of it appears herewith. This broiler is reversible, and is, it will be observed, provided with a steel hinge, which manifestly greatly strengthens it. The broiler is also reinforced by the four wires shown, which are twisted together to form the handle. By this construction the liability

pattern, on a steel track which is placed on an incline of $\frac{1}{4}$ inch to the foot, so that when the door is released it will close of its own accord. Pulleys are placed on either side of the doorway, over which a rope is run near the arch across the opening, fastened at one end to the door, and

at the other end to a balance weight. The rope is cut at the center of the doorway, and a fusible link inserted, which fuses at 162°, although strong enough to stand the strain of both the weight of the door and counterbalance weight pulling in opposite directions. A floor guide and a stop on the opposite side of the doorway complete the fixtures. In case of fire the link fuses at 162°, disconnecting the balance weight, when the door by its own

an angle that they readily enter the most compact soil by a very slight downward pressure, while in loose earth the implement requires only to be dragged along to loosen and at the same time pulverize the soil, throwing the loose, moist earth toward the roots of tender vegetation. The cultivator may also be used as a stone gatherer in rocky soil and for removing loose stones from the garden. It is also alluded to as an excellent potato digger



Majestic Wrench.

weight runs down the incline track, and by the aid of the stop and guide is wedged firmly and tightly over the opening.

Until the door is automatically released by heat it may be opened and closed with ease, being on frictionless hangers and balanced with a weight. The trimmings are made in two patterns, one for doors 2½ inches thick, and the other for doors 1½ inches thick.

The Evans Garden Cultivator.

This cultivator is being put on the market by the Terre Haute Shovel and Tool Company, Terre Haute, Ind., and is represented in the illustrations given herewith,

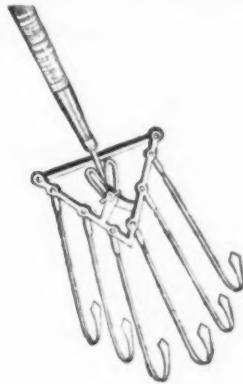


Fig. 1.—The Evans Garden Cultivator.

from which an idea of its construction will be gained, as well as of the manner in which the prongs of the implement, as shown in Fig. 2, are opened. It is re-



Fig. 2.—The Evans Garden Cultivator Open.

ferred to as cultivating on both sides of small vegetation by the mere weight of the body in pulling it through the earth. The teeth or plows are described as set at such

and seed coverer for small seeds, drilled in rows. By opening the prongs sufficiently wide to pass upon either side of the seeds, loose pulverized soil can be thrown directly over them, leaving, it is claimed, a slight elevation or small ridge directly over the seed, thereby covering them at a uniform depth and leaving them in good condition for cultivation. This work, the manufacturers state, can be done as rapidly as the operator can walk. The cultivator may also be used for cleaning yards and gardens. The great length and curve of the teeth catch and hold cornstalks, grass, weeds and decayed vegetation. A slight backward motion readily unloads the implement, or when the implement is filled with trash the same may be carried as on the prongs of a hay fork by turning the teeth upward. The inexpensiveness, durability and simplicity of this cultivator are other points made in regard to it by the manufacturers.

Majestic Wrench.

Hulbert Bros. & Co., 26 West Twenty-third street, New York, are offering the above article, as illustrated herewith. It is described as full drop forged from choicest bar steel, 5 inches in length, but through its construction, which it is stated is due to skillful forging, it is no heavier than other 4-inch wrenches, yet in no manner has the strength been lessened. It is finished throughout in a thorough manner and carefully case hardened. The jaws spread 1½ inches, and the adjustment is gauged to the slightest fraction of an inch, and when once set remains so. It is remarked that the shape of the handle allows of an additional grip being obtained, which adds greatly to its effectiveness. The manufacturers fully guarantee the Majestic to withstand any reasonable test without spreading the jaws or causing breakage.

Justice Kennedy handed down his decision in the case of Riley V. Miller and Elisha M. Moore vs. Thomas D. Jones, Mary E. Jones, Charles D. Anderson, Frank Ives and the Jones Positive Nut Lock Company, an action involving the right to manufacture what is known as the Jones safety nut lock, at Syracuse, N. Y., March 14. The court finds for the plaintiff, adjudging that the assignment and transfer of the letters patent of the "Jones safety nut lock," from the defendant Thomas D. Jones to Mary E. Jones, and from Mary E. Jones to the Jones Positive Nut Lock Company, were made with intent to cheat and defraud plaintiffs and licensees and owners of a license transferred to them by the patentee, J. D. Jones, for the exclusive manufacture of the lock.

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CURRENT HARDWARE PRICES.

MARCH 23, 1892.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers' name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

Adjusters, Blind.

Domestic	\$ dos \$3.00
Excelsior	\$ dos \$10.00
North's	list net \$10.00
Zimmerman's	—See Fasteners, Blind.

Ammunition—See Caps, Cartridges, Shells &c.

Anvils.

Eagle Anvils, F. B. 104	15@15@5%
Peter Wright's	11@11@5%
Armstrong's House Hole	10@10@5%
A.M. Wrought, Horseshoe brand	11@11@5%
Trenton	10@10@5%
Wilkinson's	10@10@5%
Moore & Barnes Mfg. Co.	33@10%

Anvil Vise and Drill.

Millers Falls Co., \$18.00	20%
Cheney Anvil and Vise	25%
Allen Anvil and Vise, \$3.00	40@10%
Star	45@5%

Apple Parers—See Parers, Apple.

Anglers and Bits.

Douglas Mfg. Co.	10@10@5%
Wm. A. Ives & Co.	10@10@5%
Humphreysville Mfg. Co.	10@10@5%
French Swift & Co., F. H. Beecher, P. S. & W. Co.	10@10@5%
Rockford Bit Company	10@10@5%
Cook's, Douglas Mfg. Co.	55@5%
Cook's, N. H. Copper Co. 50@10@50@10@5%	55@5%
Ives' Circular Lip	60%
Patent Solid Head	30%
C. E. Jennings & Co., No. 10, extension lip	40%
C. E. Jennings & Co., No. 30	60%
C. E. Jennings & Co., Auger Bits, 7 set, 33@ quarters, No. 5, 25; No. 30, 45.50@50	60%
Lewis' Patent Single Twist	45%
Russell Jennings' Augers and Bits	25@10%
Imitation Jennings' Bits	30@60@10%
Pugh's Black	20%
Pugh's Jennings' Pattern	4@5%
Car Bits	50@60@10%
Car Bits, P. S. & W. Co.	60@10%
Snell's Car Bits	60%
L. Hommodieu Car Bits	15@10%
Forstner Pat. Auger Bits	20%
Cincinnati Bell-Rangers' Bits	50@10%

Bitt Stock Drills.

Morse Twit Drills	50@10@25%
Standard	50@10@25%
Cleveland	50@10@25%
Syracuse, for metal	50@10%
Syracuse, for wood (wood list)	30@30@25%
Cincinnati, for wood	30@10%
Cincinnati, for metal	45@10%

Expansive Bits.

Clark's, small, \$18; large, \$26. 35@35@10%	
Ives' No. 4, \$ dos \$60	
Swan's	40%
Steers, No. 1, \$22; No. 2, \$22.	35%
Stearns' No. 2, \$48.	20%

Gimlet Bits.

Common	7 gross 12.75@32.25
Diamond	7 gross \$11.00
Ice	28@10%
Double Cut, Shepardson's	45@44@10%
Double Cut, Ct. Valley Mfg. Co.	30@10%
Double Cut, Hartwell's	45@10%
Double Cut, Douglass'	40@10%
Double Cut, Ives'	50@60@10%

Hollow Augers.

Ives	French Swift & Co.
Douglas	33@10%
Bonney's Adjustable	\$ dos \$48.
Stearns'	20@10%
Ives' Expansive, each \$4.50.	50@10%
Universal Expansive, each \$4.50.	20%
Wood's	25@25@10%
Cincinnati Adjustable	25@10%
Cincinnati Standard	25@10%

Ship Augers and Bits.

L'Hommedieu's	15@10@15@10@5%
Watrous'	15@10@15@10@10%
Snell's	15@10@15@10@5%
Snell's Ship Auger Pat'n Car Bits	15@10@15@10@5%

Awl Hafts—See Hafts, Awl.

Awls.

Awls, Sewing, Common	7 gr. 85@90%
Awls, Should. Peg.	7 gr. 81.50@81.55
Awls, Pat. Peg.	7 gr. 85@85@5%
Awls, Shouldered Brad.	7 gr. \$1.30@1.40
Awls, Handled Brad.	7 gr. 42.50@43.00
Awls, Handled Scratch.	7 gr. \$4.00@4.50
Awls, Socket Scratch.	7 dos \$1.10@1.20

Awl and Tool Sets—See Sets, Awl and Tool.

Axes.

Plain, Beveled.	
First quality, best brands \$7.00	
First qual., other brands \$6.62@6@5%	
Second quality.....	6.00 6.50

Axle Grease—See case, Axle.

Axes.

No. 1. 54@44@6%, No. 2. 54@6%	
Nos. 7 to 14.....	6@10%
Nos. 15 to 18.....	47@44@5%
Nos. 19 to 23.....	70%
Concord Axes, loose collar.....	24@6@6%
Concord Axes, solid collar.....	54@6@7%
National Tubular Self-Oiling.....	33@4@33@4@5%

Bag Holders—See Holders, Bag.

Balances.

Spring Balances	40%
No. 2000	20 30
Chatillon, 7 dos	20.80 0.95 1.75 net
Chatillon Straight Balance	40%
Chatillon Circular Balances	50@10%

Barb Wire.—See Wire, Barb.

Bare.

Cross—

Cast Steel

Iron, Steel Points

Bastin, Wash.

Standard Fiberglass, No. 1. 10@10@5%

12-inch, \$2.25; 13@14-inch, \$2.75; 15@16-inch, \$3.25.

Beams, Scale—

Scale Beams, List Jan. 12, '82

50@10@5%

Chatillon's No. 1.

50@10@5%

Chatillon's No. 2.

50@10@5%

Boilers—

Egg—

Dover

Duplex (Standard Co.)

Rival (Standard Co.)

Duplex Extra Heavy (Standard Co.)

Bryant's

Douglas (H. & R. Mfg. Co.)

Easy (H. & R. Mfg. Co.)

Triple (H. & R. Mfg. Co.)

Easy (H. & R. Mfg. Co.)

Improved Acme (H. & R. Mfg. Co.)

Paine, Diehl & Co.'s

Silver & Co.

Keystone, P.D.C.C., Each, No. 1; No. 2, \$2.

Ball Braces, net

Balls—

Cone—

Common Wrought

Western, Sargent's list

Kentucky, "Star"

Kentucky, Sargent's list

Kentucky Durham

Dodge, Genuine Kentucky

Dodge, 70@70@10@5%

Texas Star.....

Door—

Gong, Abbe's

Gong, Yankee

Gong, Barton's

Gong, Taylor's

Gong, Brooks'

Gong, Cone's

Gong, Connel's

Gong, Taylor's

Gong, Taylor's Brass or Plated

Gong, Taylor's Japanned

Gong, Morgan Odorless

Gong, Wollensack's

Hand—

Light Brass.....

Extra Heavy.....

White.....

Silver Chimes.....

Globe Cone's Patent

Miscellaneous—

Call—

Steel Alloy Church and School Bells

Bellows—

Blacksmiths'

Molders'

Hand Bellows

Belting, Rubber.

Common Standard.....

Standard.....

70@70@10@5%

<h

Clamps—	
S. I. Tool Co.'s Wrought Iron.....	.25¢
Adjustable, Cincinnati.....	15¢ & 10¢
Adjustable Hammers.....	15¢
Adjustable Searns'.....	.30¢ & .35¢
Adjustable Cabinet and Corner.....	.30¢ & .35¢
Cabinet, Sargent's.....	.65¢ & 10¢
Carriage Makers' Sargent's.....	.70¢ & 10¢
Carriage Makers' P. S. & W. Co. ....	.40¢ & 10¢
Charlton Mfg. Co. ....	.40¢ & .45¢
Warner's.....	.40¢ & .45¢
New Clamps, see Vises, Saw Fliers.	
Carpenters', Cincinnati.....	.25¢ & 10¢
Clevers.	
Butchers'.	
Bradley's.....	.25¢ & 30¢
L. & J. L. White.....	.20¢ & 30¢
Beatty's.....	.40¢ & 45¢
New Haven Edge Tool Co.'s.....	.40¢
P. S. & W. ....	.35¢ & .40¢ & 10¢
Foster Bros. ....	.30¢
Schulte, Lohoff & Co. ....	.40¢ & 45¢
Clips—	
Norway Axle, M & 5-16.....	.55¢ & 5¢
and Grade Norway Axle, M & 5-16.....	.55¢ & 5¢
Superior Axle Clips.....	.65¢ & .70¢
Norway Spring Bar Clips, 5-16.....	.08¢ & 5¢
Wrought-Iron Felloe Clips.....	.75¢ & 5¢
Steel Felloe Clips.....	.75¢ & 5¢
Garter Axle Clips.....	.25¢
Coats and Netting, Wire—See Wire, &c.	
Cokeyes.....	.50¢
Coeks, Brass.	
Hardware list.....	.50¢ & 25¢
Coffee Mills—See Mills, Coffee	
Cellars, Dog, &c.	
Madison Fancy Goods Co. ....	.40¢ & 10¢
Embossed, Gilt, Pope & Steven's list.....	.30¢ & 10¢
Leather, Pope & Steven's list.....	.40¢
Brass, Pope & Steven's list.....	.40¢
Chapman Mfg. Company.....	.50¢ & 10¢ & .60¢
Combs, Curry.	
Fitch's.....	.50¢ & 10¢ & .50¢ & 10¢ & 10¢
Brether, per doz \$10.00.....	.30¢
American Curry Comb Co.	Net prices
Compasses, Dividers, &c.—	
Compasses, Calipers, Dividers, 70¢ & 10¢	
Dividers.....	.50¢ & 5¢
Compasses & Calipers.....	.50¢ & 5¢
Wing and Inside or Outside.....	.50¢ & 5¢
Double.....	.60¢
(Call's Pat. Inside). ....	.30¢
Excisor.....	.50¢
J. Stevens & Co.'s.....	.35¢ & 10¢
Starnett's.	
Spring Calipers and Dividers.....	.25¢ & 10¢
Lock Calipers and Dividers.....	.25¢
Combination Dividers.....	.25¢
Coopers' Tools—See Tools, Coopers'.	
Cord—	
Sash.	
Common.....	Y D. 10¢ & 11¢
Patent, good quality.....	Y D. 12 & 13¢
White Cotton Braided, Fair, Y D. 24 & 25¢	
Common Braided Sash.....	Y D. 12 & 13¢
Patent Sash.....	Y D. 14¢
Cable Laid Italian Sash.....	Y D. 21 & 22¢
India Cable Laid Sash.....	Y D. 12¢
Silver Lace—	
A Quality, White 50¢.....	.25¢
B Quality, Drab, 55¢.....	.25¢
B Quality, White, 50¢.....	.10¢
B Quality, Drab, 55¢.....	.10¢
Sylvan Spring, Extra Braided White, 34¢	
Sylvan Spring, Extra Braided, Drab, 39¢	
Semper Idem, Braided, White, 30¢	
Egyptian, India Hemp, Braided, 26¢	
Massachusetts, White, 26¢	
Samson—	
Braided, White Cotton, 50¢ .....	.30¢ & .35¢
Braided, Drab Cotton, 55¢ .....	.30¢ & .35¢
Braided, Italian Hemp, 55¢ .....	.30¢ & .35¢
Braided, Linen, 80¢ .....	.30¢ & .35¢
Tate's Cotton Braided, White, Y D. 28¢ & 10¢	
Wire Picture.	
Braided or Twisted.....	.75¢ & 10¢
Corkscrews—See Screws, Cork.	
Corn Knives and Cutters—See Knives, Corn.	
Crackers, Nut—	
Table (H. & B. Mfg. Co.).....	.40¢
Hale's Pattern, Y dos \$2.00, 10¢	
Turner & Seymour Mfg. Co. ....	.50¢
Cradles—	
Grain.....	.50¢ & .55¢ & .60¢ & 10¢ & 25¢
Crayons.	
White Crayons, Y gross.....	10¢
D. M. Stewart Mfg. Co., Metal Work- ers, Y gr. \$2.50.....	.25¢
D. M. Stewart Mfg. Co., Rolling Mill, Y gr. \$2.50.....	.25¢
See also Chalk.	
Crow Bars—See Bars, Crow.	
Curry Combs—See Combs, Curry.	
Curtain Pins—See Pins, Curtain.	
Cutters—	
Metal.	
Dixon's Y dos.....	.40¢ & 5¢
Nos. 1 2 3 4 B 5	
\$14.00 \$17.00 \$19.00 \$30.00	
Woodruff's Y dos.....	.40¢ & 25¢
Nos. 100 150	
\$15.00 \$18.00	
Hales Pattern Y dos.....	.70¢ & .75¢
Nos. 11 13 15	
\$37.00 \$33.00 \$45.00	
American.....	.90¢
Nos. 1 2 3 4 B 5	
Each. \$5 \$7 \$10 \$12 \$15 \$20	
Enterprise Y dos.....	.40¢ & 5¢
Nos. 10 12 22 32 42	
Each. \$5 \$7.50 \$8 \$10 \$15	
Great American Meat Cutter.....	.90¢
Nos. 113 116 118 120 122	
Each. \$3.00 \$3.75 \$3.00 \$3.50 \$4.00	
Hiles' Challenge Y dos.....	.45¢ & .50¢ & 10¢
Nos. 2 5	
\$22.00 \$20.00 \$40.00	
Home No.	Y dos \$26.00, .55¢ & 10¢
Draw Cut, each:	
Nos. 5 6 7 8	
\$50 \$75 \$80 \$82.50	
Beef Shavers (Enterprise).....	.20¢ & 10¢ & 30¢
Little Giant (P. S. & W. Co.) ....	.50¢
Chadborn's Smoked Beef Cutter, Y dos	
Tobacco.	
Champion.....	.20¢ & 10¢ & 30¢
All Iron, Y dos \$4.25	
Nashua Lock Co.'s, Y dos \$18.00 \$20.50	
Wilson's.....	.55¢
Sargent's, Y dos \$24.50 \$25.10¢	
Acme.....	.20¢ & 30.00, 40¢
Washer.	
Smith's Pat. Y dos \$12.00, .20¢ & 10¢ & 10¢	
Johnson's, Y dos \$11.00, .33¢ & 10¢	
Penny's, Y dos Pol. \$14, Jap'd, \$16.00, .55¢	
Appleton's.....	.20¢ & 16.00, .60¢ & 10¢
Bonney's.....	.20¢ & 10¢
Cincinnati.....	.25¢ & 10¢
Enamelled and Tinned Ware	
See Ware, Hollow.	
Escutcheon Pins—See Pins, Es- cutcheon.	
Escutcheons.	
Door Lock.... Same dis as Door Locks.	
Brass Thread.....	.60¢ & 60¢ & 10¢
Wood.....	.25¢
Expanded Metal.	
List No. 5.	
Lathing.....	.10¢
Fencing, Painted Sheets.....	.20¢
Netting, Painted Sheets.....	.20¢
Door Mats, Galvanized.....	.25¢
Window Guards, Panelled.....	.15¢
Tree Guards, Panelled.....	.15¢
Extractors, Lemon Juice—See Squeezers, Lemon.	
Dampers, &c.—	
Dampers, Buffalo.....	.40¢ & 10¢
Buffalo Damper Clips.....	.40¢ & 10¢
Crown Damper.....	.40¢
Excelidor.....	.40¢ & 10¢
Diggers, Post Hole, &c.—	
Samson Post Hole Digger, Y dos \$36.00,	
Fletcher Post Hole Augers, Y dos \$26, 20¢	
Eureka Diggers.....	.25¢
Vaughan's Post Hole Auger, Y dos \$13.00	
Kohler's Little Giant.....	.Y dos \$18.00
Kohler's Hercules.....	.Y dos 1.75¢
Kohler's New Champion.....	.Y dos \$20.00
Schnefelder.....	.Y dos \$18.00
Ryan's Post Hole Diggers, Y dos \$24.00	
Cork Lined.....	.70¢ & 5¢ & 10¢
Burnside's Red Cedar.....	.50¢
Burnside's Red Cedar, bbl lots.....	.50¢ & 10¢
John Sommers'	
Peerless Best Block Tin Key.....	.40¢
EL, 1st Quality, Cork Lined.....	.40¢
Standard Lock.....	.40¢
Perfection, Red Cedar.....	.50¢
Goodenough Cedar.....	.50¢
Boss Metallic Key.....	.50¢
Reliable Cork Lined.....	.50¢
Western Pattern Cork Lined.....	.50¢
Self Measuring	
Enterprise, Y dos \$36.00.....	.20¢ & 10¢
Lane's, Y dos \$36.00.....	.25¢ & 10¢
Victor, Y dos \$30.00.....	.25¢ & 10¢
Felice Plates—See Plates, Felice.	
Fifth Wheels—	
Derby and Cincinnati.....	.45¢ & 5¢
Brewster.....	.50¢ & 5¢
Files—	
Domestic—	
Nicholson Files, Rasps, &c.	
No. 60 & 10 & 20 & 30 & 10¢ & 25¢	
Nicholson (X. F.) Files.....	.25¢
Nicholson's Royal Files (Seconds).....	.75¢
(extra prices on certain sizes)	
G. & H. Barnett (Black Diamond).....	
60¢ & 10¢ & 20¢ & 10¢ & 25¢	
Arcade.....	.60¢ & 10¢ & 20¢ & 10¢ & 10¢
Eagle.....	.60¢ & 10¢ & 20¢ & 10¢ & 10¢
Other makers, best brand 60¢ & 10¢ & 20¢ & 10¢	
Fair brands.....	.60¢ & 10¢ & 20¢ & 10¢
Second quality.....	.70¢ & 10¢ & 25¢ & 10¢
Heller's Horse Rasps.....	.50¢ & 75¢ & 10¢ & 20¢
McCaffrey's Horse Rasps.....	.50¢ & 10¢ & 20¢
Cheese Horse Rasps, Hand Cut.....	.50¢ & 10¢
Arcade Horse Rasps.....	.60¢ & 10¢
Butcher.....	Butcher's list, 20¢
Stubs.....	Stubs list, 25¢ & 30¢
Fixtures.	
Grindstone—	
Sargent's Patent.	
Reading Hardware Co. ....	.30¢ & 10¢
P. S. & W. Co. ....	.50¢ & 10¢
Fluting Machines—See Machines, Fluting.	
Fluting Scissors—See Scissors, Fluting.	
Feeder Squeezers—See Squeezers, Fodder.	
Forks—	
Hay, Manure, &c., Assn List \$5.25 & \$6.50 & 10¢	
Hay, Manure, &c., Phila. List, \$6.00 & \$6.50	
Plated, see Spoons.	
Frames—	
Swag—	
White Vermont.....	Y gro \$9.00 & 10.00
Red, Polished and Varnished.....	Y dos \$1.50, 2.50, 25¢
Nos. 20, 30 and 60.....	
P. S. & W.	
Knapp & Cowles:	
Nos. 1 Forged Blade.....	.60¢ & 10¢ & 20¢
Nos. 2, 3, 4 and 60.....	
P. S. & W.	
Porter's Pat. Window and Door Frame.....	
Warren's Screen Corner Irons.....	
Stearns' Frames and Corners.....	
Cortland.....	.40¢ & 45¢
Screen, Window and Door—	
Porter's Pat. Window and Door Frame.....	
Warren's Screen Corner Irons.....	
Stearns' Frames and Corners.....	
Cortland.....	.40¢ & 45¢
Freezers, Ice Cream—	
White Mountain.....	.60¢ & 60¢ & 5¢
Granite State.....	.65¢ & 65¢ & 5¢
Arctic.....	.70¢ & 70¢ & 5¢
American.....	.65¢
Buffalo Champion.....	.65¢ & 65¢ & 5¢
Shepard's Lightning.....	.65¢ & 65¢ & 5¢
Gem.....	.65¢
Blizzard.....	.70¢
Double Action Crown.....	.60¢
Crown.....	.60¢
Peerless.....	.60¢ & 10¢
Giant.....	.60¢
Zero.....	.60¢ & 10¢ & 10¢
Boss and Pet.....	.60¢ & 10¢ & 10¢
Keystone, P. D. & Co., each \$1.50.....	.20¢ & 10¢
Per dos.....	\$0.90 1.00 1.10 1.35 1.50
Per 100.....	.60¢ & 10¢
Roggins' Latches.....	Y dos \$3.00 & 3.50
Bronze Iron Drop Latches.....	Y dos 70¢ net
Jap'd Store Door Handles—Nuts, \$1.65	
Plate, \$1.00; No Plate, \$0.85.....	net
Barn Door, Y dos \$1.40.....	.10¢ & 10¢
Chest and Lifting.....	.70¢
Wood—	
Saw and Plane.....	.40¢ & 10¢ & 10¢ & 10¢
Hammer, Hatchet, Axe, &c. ....	.40¢ & 40¢ & 5¢
Brad Awl.....	.7¢ & 8¢ & 10¢
Hickory Firmer Chisel, ass'd. Y gr. 4.50	
Hickory Firmer Chisel, large, Y gr. 4.00	
Apple Firmer Chisel, ass'd. Y gr. 4.00	
Apple Firmer Chisel, large, Y gr. 4.00	
Socket Firmer Chisel, ass'd. Y gr. 4.00	
J. B. Smith & Co.'s Pat file.....	.50¢
File, assorted.....	.6¢ & 7.75¢
Auger, assort'd.....	.6¢ & 5.00
Auger, large.....	.6¢ & 7.00
Fruit and Jelly Presses—See Presses, Fruit and Jelly.	
Fry Pans—See Pans, Fry.	
Funnels.	
Gerdorff's Perfection, Standard and Globe; Tin, 1 gro, 10 s; 2 to 5 gro,	
20 s; 5 to 10 gro.....	.30¢
Copper, 1 to 6 doz, 15 s; 6 to 12 doz, 20 s; over 12 doz.....	.25¢
Furnaces, Soldering.	
Burgess No. 3 Gem, tin reservoir, ...	\$7.00
Burgess No. Gem, copper reservoir, \$5.00	

Mallets. 20[¢] to 20[¢] to 20[¢] to 10[¢]
Hickory..... 20[¢] to 20[¢] to 20[¢] to 10[¢]
Lignum-vite..... 20[¢] to 20[¢] to 20[¢] to 10[¢]
E. & L. Block Co., Hickory & L. V.
30[¢] to 30[¢] to 10[¢]

Hattocks. Regular list. 60[¢] to 60[¢] to 10[¢] to 5[¢]

Measures—
Standard Fibreware, No. 1, peck, 9
dozen, \$4; 1/2 peck, \$3.50.

Meat Cutters—See Cutters, Meat.

Menders, Harness— \$2.00

Per doz..... \$2.00

Mills—

Coffee—

Box and Side, List Jan. 1, 1888. 60[¢] to 60[¢] to 10[¢]

Net prices are often made which are lower than above discount.

American, Enterprise Mfg Co. 30[¢] to 10[¢] to 30[¢]

The Swift, Lane Bros. 20[¢] to 10[¢] to 30[¢]

Mincing Knives—See Knives, Mincing.

Molasas Gates—See Gates, Molasses.

Honey Drawers—See Drawers, Money.

Mowers, Lawn.

Pennsylvania, New Model, Excelsior.

Continental, &c. 60[¢] to 60[¢] to 10[¢]

Philadelphia..... 60[¢] to 60[¢] to 10[¢]

Perfection..... 60[¢] to 60[¢] to 10[¢]

Easy..... 60[¢] to 60[¢] to 10[¢]

Bay State..... 60[¢] to 60[¢] to 10[¢]

Other Machines..... 60[¢] to 10[¢] to 70[¢] to 25[¢]

Muzzles— \$ dos, \$3.00, 25[¢]

Safety..... \$ dos, \$3.00, 25[¢]

Nails. Cut and Wire. See Trade Report.

Wire Nails, Papered.

Association list, July 15, '89. 75¢ to 10¢ to 80¢

Tack Mfrs' list..... 70¢ to 70¢ to 10[¢]

Wire Nails, Standard Penny.

Card June 1 '89 base..... \$1.95 @ \$2.00

Horse—

Nos. 6 7 8 9 10

American. 84¢ 84¢ 84¢ 84¢ 84¢ 84¢ net

Nos. 6 7 8 9 10

Ausable.... 28¢ 28¢ 28¢ 28¢ 28¢ 28¢

Clinton, Fin. 19¢ 17¢ 16¢ 15¢ 14¢ 13¢ 10[¢]

Erie..... 28¢ 28¢ 28¢ 28¢ 28¢ 28¢

Lyras..... 19¢ 17¢ 16¢ 15¢ 14¢ 13¢ 10[¢]

Snowden 19¢ 17¢ 16¢ 15¢ 14¢ 13¢ 10[¢]

Putnam..... 23¢ 21¢ 20¢ 19¢ 18¢ 16¢

Vulcan..... 23¢ 21¢ 20¢ 19¢ 18¢ 16¢

Northwest'n. 23¢ 23¢ 22¢ 21¢ 20¢ 18¢

25¢ to 25¢ 25[¢]

A. C..... 25¢ 23¢ 23¢ 21¢ 20¢ 18¢

25¢ to 10¢ to 25[¢]

Baldwin..... 25¢ 10¢ to 23¢ 25¢ 25[¢]

Bonanza..... 25¢ 10¢ to 23¢ 25¢ 25[¢]

Daisy..... 25¢ 10¢ to 23¢ 25¢ 25[¢]

Dandy..... 25¢ 10¢ to 23¢ 25¢ 25[¢]

Eclipse..... 25¢ 10¢ to 23¢ 25¢ 25[¢]

Eureka, 1888.

Family Bay State..... 25¢ 10¢ to 23¢ 25¢ 25[¢]

Favorite..... 25¢ 10¢ to 23¢ 25¢ 25[¢]

Gold Medal..... 25¢ 10¢ to 23¢ 25¢ 25[¢]

Ideal..... 25¢ 10¢ to 23¢ 25¢ 25[¢]

Improved Bay State..... 25¢ 10¢ to 23¢ 25¢ 25[¢]

Little Star..... 25¢ 10¢ to 23¢ 25¢ 25[¢]

Monarch..... 25¢ 10¢ to 23¢ 25¢ 25[¢]

New Lightning..... 25¢ 10¢ to 23¢ 25¢ 25[¢]

Oriole..... 25¢ 10¢ to 23¢ 25¢ 25[¢]

Penn..... 25¢ 10¢ to 23¢ 25¢ 25[¢]

Perfection..... 25¢ 10¢ to 23¢ 25¢ 25[¢]

Pomona..... 25¢ 10¢ to 23¢ 25¢ 25[¢]

Rocking Table..... 25¢ 10¢ to 23¢ 25¢ 25[¢]

Turn Table..... 25¢ 10¢ to 23¢ 25¢ 25[¢]

Victor..... 25¢ 10¢ to 23¢ 25¢ 25[¢]

Waverly..... 25¢ 10¢ to 23¢ 25¢ 25[¢]

White Mountain..... 25¢ 10¢ to 23¢ 25¢ 25[¢]

Champlain..... 25¢ 10¢ to 23¢ 25¢ 25[¢]

Saranac..... 25¢ 10¢ to 23¢ 25¢ 25[¢]

Champion..... 25¢ 10¢ to 23¢ 25¢ 25[¢]

10[¢] to 10[¢] to 10[¢]

Capewell..... 19¢ 18¢ 17¢ 16¢ 15¢ 14¢

White Mountain..... 19¢ 18¢ 17¢ 16¢ 15¢ 14¢

Anchor..... 23¢ 21¢ 20¢ 19¢ 18¢ 17¢

Western..... 23¢ 21¢ 20¢ 19¢ 18¢ 17¢

Empire Bronzed..... 14¢ 12¢

Picture—

Brass Head, Sargent's list..... 50¢ to 10[¢] to 10[¢]

Brass Head, Combination List..... 50¢ to 10[¢] to 10[¢]

Porcelain Head, Sargent's list..... 50¢ to 10[¢] to 10[¢]

Porcelain Head, Combination List..... 40¢ to 10[¢] to 10[¢]

Niles' Patent..... 40¢ to 10[¢] to 10[¢]

Nail Pullers—See Pullers, Nail.

Nail Sets—See Sets, Nail.

Nut Crackers—See Crackers, Nut.

Nuts—List Dec. 18, 1889.

Square, Hex.

Hot Pressed..... 5.8¢ 5.8¢ off list.

Cold Punched..... 5.0¢ 5.1¢ off list.

In packages of 100 lb., add 1-10¢ per lb., net; in packages less than 100 lb., add 14¢ per lb.

Oakum—

Best or Government..... \$ B 70¢ to 74¢

U. S. Navy..... \$ B 66¢ to 68¢

Navv..... \$ B 54¢ to 60¢

Oilers—

Zinc and Tin..... 65¢ to 10¢ to 70¢ to 5¢

Brass and Copper..... 50¢ to 10¢ to 50¢ to 25¢

Malleable, Hammers Improved, No. 1, 10¢ to 2, \$2.40; No. 3, \$4.40; \$10.00.

10¢ to 10¢ to 25¢

Malleable, Hammers, Old Pattern, same list..... 40¢

Prior's Pat. or "Paragon" Zinc, 60¢ to 10¢ to 10¢

Prior's Pat. or "Paragon" Brass, 60¢ to 10¢ to 10¢

Olmstead's Tin and Zinc, 60¢

Olmstead's Brass and Copper, 60¢

Broughton's Zinc, 60¢

Broughton's Brass, 60¢

Gem P. D. & Co., 7¢ gro. #2

Steel, Draper and Williams, 60¢

Openers, Cigar.

Messenger's Comet..... \$ dos, \$1.00, 25¢

American..... \$ dos, \$1.16, 25¢

Duplex..... \$ dos, \$1.16, 25¢

Lyman's..... \$ dos, \$1.75, 20¢

No. 4 French..... \$ dos, \$2.25, 55¢ to 60¢

No. 5, Iron Handle..... \$ dos, \$2.25, 55¢ to 60¢

Erica..... \$ dos, \$2.25, 55¢ to 60¢

Inserted Joints Casing..... 50¢

Steel Boiler Tubes..... 50¢

Pianos and Plane Irons—

Wood Frame..... 40¢ to 10¢ to 10¢

Brass, First Quality..... 50¢ to 10¢ to 10¢

Brass, Second Quality..... 55¢ to 10¢ to 10¢

Iron Planes..... 50¢ to 10¢ to 10¢

Bailey's (Stanley R. & L. Co.)..... 50¢ to 10¢ to 10¢

Miscellaneous Planes (Stanley R. & L. Co.)..... 55¢ to 10¢ to 10¢

Wood Frame..... 55¢ to 10¢ to 10¢

Size 3 in. and larger..... 55¢

Casing..... 55¢ to 10¢ to 10¢

Inserted Joints Casing..... 50¢

Steel Boiler Tubes..... 50¢

Pipes, Wrought Iron—

List September 18, 1889.

14¢ and under, Plain..... 57¢ to 60¢ to 60¢

14¢ and over, Galvanized..... 57¢ to 60¢ to 60¢

14¢ and over, Galvanized..... 57¢ to 60¢ to 60¢

Pins—

Bone..... net

Humason, Beckley & Co.'s..... 60¢ to 10¢ to 10¢

Sargent & Co.'s..... \$17 and \$18..... 60¢ to 10¢ to 10¢

Peck, Stow & W. Co..... 60¢ to 10¢ to 10¢

Curtain..... net

Escutcheon..... net

Iron, list Nov. 1, 1888. 50¢ to 10¢ to 10¢

Brass..... 60¢ to 10¢ to 10¢

Pipe Irons—

Butcher's..... \$ dos, \$15.00, 25¢ to 25¢

Buck Bros..... 30¢ to 10¢ to 10¢

Auburn "Thistle" Ohio..... 30¢ to 10¢ to 10¢

Sandusky..... 30¢ to 10¢ to 10¢

S. & I. J. White..... 25¢

Stanley R. & L. Co..... 50¢ to 10¢ to 10¢

Plates.

Fellow..... \$ B 6¢ to 6¢

Pliers.

Button's Patent..... 50¢ to 10¢ to 10¢

Hall's No. 2, 5 in., \$13.50; No. 4, 7 in., \$21.00 \$ dos

Universal, \$ dos \$3.00..... 5¢ to 5¢

Domestic, \$ dos \$2.50..... 5¢ to 5¢

Champion, \$ dos \$2.00..... 5¢ to 5¢

Packing, Steam—

Rubber..... Standard..... 60¢ to 60¢ to 60¢

Extra..... 50¢ to 50¢ to 50¢

N. Y. B. & P. Co., Standard..... 50¢

N. Y. B. & P. Co., Empire..... 60¢

N. Y. B. & P. Co., Salamander..... 25¢

Jenkins' Standard, \$ B 80¢, 25¢ to 25¢ to 25¢

Miscellaneous—

American Packing..... 10¢ to 11¢ \$ B 2

Universal Packing..... 14¢ \$ B

Italian Packing..... 13¢ to 14¢ \$ B

Cotton Packing..... 15¢ to 17¢ \$ B

Jute..... 7¢ to 8¢

Pants.

Button's Patent..... 50¢ to 10¢ to 10¢

Hall's No. 2, 5 in., \$13.50; No. 4, 7 in., \$21.00 \$ dos

Sliding Door, Bronze'd W't Iron, \$ ft. 7¢

Sliding Door, Iron, Painted, \$ ft. 6¢

Barn Door, Light. In., 1¢ to 1¢ to 1¢ to 1¢

Per 100 feet..... \$2.00 to 2.50 to 3.00 to 3.50 to 4.00

Avery's Revolving..... 40¢

Avery's Saw-Set and Punch. See Saw Sets.

Pliers.

Button's Patent..... 50¢ to 10¢ to 10¢

Hall's No. 2, 5 in., \$13.50; No. 4, 7 in., \$21.00 \$ dos

Sliding Door, Bronze'd W't Iron, \$ ft. 7¢

Sliding Door, Iron, Painted, \$ ft. 6¢

Barn Door, Light. In., 1¢ to 1¢ to 1¢ to 1¢

Per 100 feet..... \$2.00 to 2.50 to 3.00 to 3.50 to 4.00

March 24, 1899

Tinware— Stamped, Jappanned and Pieced, list Jan. 20 1887.....	70@10@70@25%
Tire Benders, Upsetters, &c.— See Benders and Upsetters, Tire.	
Tools.— Coopers'—	20%
Bradley's.....	20@20@5%
Barton's.....	20@20@5%
I. & J. White.....	20@5%
Albertson Mfg. Co.	25%
Beatty's.....	30%
Sandusky Tool Co.	30@30@5%
Shaves, Cincinnati Tool Co.	20%

Lumber.	
Rim Peavies, "Blue Line"....	W dos \$20.00
Rim Peavies, Common....	W dos \$18.00
Steel Socket Peavies....	W dos \$21.00
Mall Iron Socket Peavies....	W dos \$19.00
Cant Hooks, "Blue Line"....	W dos \$16.00
Cant Hooks, Common Finish, Wdos \$14.00	
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish....	\$16.00
Cant Hooks, Mall. Socket Clasp, Common Finish....	W dos \$15.00
Cant Hooks, Clip Clasp, "Blue Line" Finish....	W dos \$14.00
Cant Hooks, Clip Clasp, Common Finish....	W dos \$12.00
Hand Spikes.....	W dos 6 ft., \$18.00; 8 ft., \$20.00
Pike Poles, Pike & Hook....	W dos, 13 ft., \$11.50; 14 ft., \$12.00; 15 ft., \$13.50;
Pike Poles, Pike only, W dos, 12 ft., \$10.00; 13 ft., \$11.00; 14 ft., \$12.00; 15 ft., \$13.00; 16 ft., \$14.00; 20 ft., \$20.00,	
Pike Poles, not ironed, W dos, 12 ft., \$10.00; 14 ft., \$12.00; 16 ft., \$14.00; 18 ft., \$16.00; 20 ft., \$21.50,	
Setting Poles, 12 ft., \$14.00; 14 ft., \$15.00; 16 ft., \$17.00	
Swamp Hooks.....	W dos \$18.00

Saw.

Atkins' Perfection.....

Atkins' Excelsior.....

Atkins' Giant.....

Tobacco Cutters—See Cutters, Tobacco.

Transom Lifters—See Lifters, Transom.

Traps—

Game—

Newhouse.....

Ondreia Pattern.....

Game, Blakely.....

Game, Blakely, Extra Heavy.....

Mouse Wood, Choker, W dos holes, 9@10

Mouse, Round Wire.....

Mouse, Cage, Wire.....

Mouse, Catch 'em alive....

Mouse, Bonanza....

Rat, Decoy.....

ideal.....

Hotchkiss Metallic Mouse, 5-hole traps, W dos, 90¢; in full cases, W dos, 75¢

Hotchkiss Imp. Rat Killer, W gro \$18.50

Hotchkiss New Rat Killer, W gro \$16.50

Schuyler's Rat Killer.....

Wires—

Butter and cheese.....

Trimmers, Spoke.

Bonney's.....

Decorators.....

Ives, No. 1, \$15.00; No. 2, \$12.00 W dos

55@10%

Douglas'.....

W dos \$9.00, 20%

Cincinnati.....

25%

Trowels—

Lothrop's Brick and Plastering.....	20@10@5@25%
Diaston's Br'k and Plastering.....	15%
Peace's Plastering.....	25%
Clement & Maynard's.....	20%
Rose's Bricks.....	15@20%
Brade's Bricks.....	25%
Worrell's Bricks and Plastering.....	20%
Garder.....	20%
Cleves' Angle Trowel, W gro \$1.50, net @10%	

Trucks, Warehouse, &c.—	
B. & L. Block Co.'s list, '88.....	40%

Tubes, Bellier—

See Pipe.

Twine—

Flax Twine—	BC. B.
No. 9, 1/4 and 1/2 Balls.....	25@ 31
No. 12, 1/4 and 1/2 Balls.....	24@ 30
No. 15, 1/4 and 1/2 Balls.....	20@ 29
No. 24, 1/4 and 1/2 Balls.....	20@ 29
No. 36, 1/4 and 1/2 Balls.....	18@ 28
No. 264, Mattress, 1/4 and 1/2 Balls, \$2.50	
Chalk Line, Cotton, 1/4 Balls.....	25
Mason Line, Linen, 1/4 Balls.....	55@
2-Ply Hemp, 1/4 and 1/2 Balls (Spring Twine).....	15@
3-Ply Hemp, 1/4 Balls.....	14@15
Cotton Wrapping, 5 Balls to 1/2 B. 15@16	
Wool.....	31@46@
Paper.....	15@14@
Cotton Mops, 6, 9, 12 and 18 B. to dos.....	18@

Vises—

Solid Box.....	50@10@50@10@25%
Parallel—	
Fisher & Norris Double Screw.....	15@10@
Parker's.....	20@25
Wilson's.....	55@
Howard's.....	40@10@
Millers Falls.....	40@40@10@10@
Trenton.....	40@20@40@10@
Merrill's.....	15@20@
Sargent's.....	60@10@12@
Buckus and Union.....	40@
Double Screw Leg.....	15@10@
Parsons.....	20@25
Simpson's Adjustable.....	40@
Moore's.....	50@
Massey Quick Action.....	30@ 25@

Vials—

Spittoons, No. 2, W dos.....	\$8.40
Wash-Basins, 10 1/2 in.....	\$2.25
Wash-Basins, 12 in.....	2.75
Koelers, Nested, Nos. 1, 2, 3 and 4 (4 pieces), \$ nest.....	12.50
Koelers, Nested, Nos. 1, 2, 3 and 4 (4 pieces), \$ nest.....	12.50
Butter Bowls, 15, 17 and 19-inch (3 pieces), \$ nest.....	11.70
Liquid Measures, pt, qt, 3 qt, and funnel (4 pieces) \$ set.....	\$1.00
See also Pails.	

Witers—

Iron.....	W 31@6
Steel.....	W 31@6

Weights, Sash—

Solid Eyes.....	W ton \$14@21@
Well Buckets, Galvanized—See Buckets, Well, Galvanized.	

Wedges—

Iron.....	W 31@6
Steel.....	W 31@6

Weights, Sash—

Solid Eyes.....	W ton \$14@21@
Well Buckets, Galvanized—See Buckets, Well, Galvanized.	

Wheels, Well—

8 in., \$2.25; 10 in., \$2.70; 12 in., \$3.25	
Wire and Wire Goods—	

Wire—

Market.....	
Br. & Ann., Nos. 0 to 18 75@10@80%	

Cop'd, Nos. 0 to 18.....	75@5@75@10@
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Wringers, Clothes—

A. Wringer Co.'s list, July 15, '91, 2% cash	
Colby Wringer Co., list Sept. 1, '91, 2% cash	
Iowell Mfg. Co., list Jan. 1, 1892, 2% cash	
Pearless Mfg. Co., list Feb., 1892, 2% cash	

Wrought Goods—

Staples, Hooks, &c., list Jan. 12, 1892, 5@8@10@	
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Color in Oil—

Black, Drop, Frankfort.....	25@ 30
Black, Drop, English.....	12@ 15

Black, Drop, Dom. stic

Black, Drop, Lampblack, Rest.....	20@ 35
Black, Lampblack, Common.....	7@ 18

Black, Ivory

Black, Ivory.....	8@ 15
Red, Venetian, American.....	9@ 11

Color in Oil.

Red, Venetian, English.....	100 lb. 1.25
Red, Venetian, English.....	1.25@

Color in Oil.

lots of 1 ton and over.....	10@ 11@
lots of less than 1 ton.....	11@ 12@

Discounts

Discounts on 10@ bbls. lots of 1 ton or as sorted grades, 1%; 25 bbls, 2%; 50 bbls, 4%.	
No discount allowed on less than bbl. lots.	

Color in Oil.

Black, Drop, Frankfort.....	25@ 30
Black, Drop, English.....	12@ 15

Color in Oil.

Black, Drop, Dom. stic.....	7@ 10
Black, Lampblack, Rest.....	20@ 35

Color in Oil.

Black, Ivory.....	8@ 15
Red, Venetian, English.....	9@ 11

Color in Oil.

Black, Ivory.....	8@ 15
Red, Venetian, English.....	9@ 11

Color in Oil.

Black, Ivory.....	8@ 15

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CURRENT METAL PRICES.

MARCH 23, 1892.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.
Bar Iron from Store.

Common Iron:	
$\frac{3}{4}$ to 2 in. round and square..	per lb. 1.90 @ 2.00¢
1 to 6 in. x $\frac{3}{4}$ to 1 in....	
Refined Iron:	
$\frac{3}{4}$ to 2 in. round and square.	
1 to 4 in. x $\frac{3}{4}$ to 1 $\frac{1}{2}$ in....	per lb. 2.00 @ 2.20¢
4 $\frac{1}{2}$ to 6 in. x $\frac{3}{4}$ to 1 in....	
Rods— $\frac{3}{4}$ and 1 $\frac{1}{2}$ round and sq.	per lb. 2.10 @ 2.30¢
Bands—1 to 6 x 3-16 to No. 12.	per lb. 2.30 @ 2.50¢
"Burden Best" Iron, base price.	3.00¢
Burden's "H. B. & S." Iron, base price.....	2.80¢
"Ulster"	3.00¢
Norway Bars.....	8.75 @ 4.00¢
Norway Shapes.....	4.50 @ 5.00¢

Merchant Steel from Store.

Per pound	
Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots.....	23¢
Best Cast Steel, base price in small lots.	8¢
Best Cast Steel Machinery, base price in small lots.....	5¢

Sheet Iron from Store.

Black.	
Common R. G. Cleaned American.	American.
Nos. 10 to 16.	per lb. 3¢ @ ...
17 to 20.	3¢@ ...
21 to 24.	3¢@ ...
25 and 26.	3¢@ ...
27.	3¢@ ...
28.	3¢@ ...
American B. B.	per lb. 4¢ @ 4¢@

Galvanized Sheet Iron.

B. B.	
Nos. 10 to 16.	per lb. 4.20¢
17 to 22.	4.60¢
23 to 24.	4.90¢
25 to 26.	5.30¢
27.	5.60¢
28.	5.70¢
29 to 30.	6.70¢
Genuine Russia, according to assortment.....	per lb. 11 $\frac{1}{4}$ ¢ @ 11 $\frac{1}{4}$ ¢
Patent Planished.....	per lb. A. 10¢ : B. 9¢
Craig Polished Sheet Steel.....	per lb. 8¢@

English Steel from Store.

Best Cast.....	per lb. 15¢
Extra Cast.....	per lb. 16 $\frac{1}{2}$ ¢ @ 17¢
Swaged. Cast.....	per lb. 16¢
Best Double Shear.....	per lb. 15¢
Blister, 1st quality.....	per lb. 12¢
German Steel, Best 2d quality.....	per lb. 10¢
3d quality.....	9¢
Sheet Cast Steel, 1st quality.....	per lb. 15¢
2d quality.....	14¢
3d quality.....	14¢
R. Moshet's "Special" "Titanic".....	per lb. 48¢

METALS.

Tin.	
Banca, Pigs.....	per lb. 22 @ ...
Straits, Pigs.....	21 @ 21 $\frac{1}{4}$ ¢
Straits in Bars.....	23 x

Tin Plates.

Duty: 2.2 cents per pound.	
Charcoal Plates—Bright.	

Guaranteed Plates command special prices, according to quality.

Per box.	
Melyn and Calland Grade. IC, 10 x 14.	@ \$6.50
" " " " 12 x 12.	@ 6.75
" " " " 14 x 20.	@ 6.50
" " " " 20 x 28.	@ 6.00
" " " " 28 x 36.	@ 13.00
" " " " 36 x 44.	@ 8.50
" " " " 44 x 52.	@ 8.75
" " " " 52 x 60.	@ 8.50
" " " " 60 x 68.	@ 17.00
" " " " DC, 12 $\frac{1}{2}$ x17.	@ 6.00
" " " " DX, 12 $\frac{1}{2}$ x17.	@ 8.00
Allaway Grade.....	IC, 10 x 14. @ 6.00
" " " " IC, 12 x 12.	@ 6.25
" " " " IC, 14 x 20.	@ 6.00
" " " " IC, 20 x 28.	@ 12.00
" " " " IX, 10 x 14.	@ 7.50
" " " " IX, 12 x 12.	@ 7.75
" " " " IX, 14 x 20.	@ 7.50
" " " " IX, 20 x 28.	@ 15.00
" " " " DC, 12 $\frac{1}{2}$ x17.	@ 5.50
" " " " DX, 12 $\frac{1}{2}$ x17.	@ 7.00

Coke Plates—Bright.

Steel Coke.—IC, 10 x 14, 14 x 20.	\$5.70 @ ...
10 x 20.	8.50¢
20 x 28.	11.50 @ ...

IX, 10 x 14, 14 x 20.	12.00
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BV Grade.—IC, 10 x 14, 14 x 20.	7.00
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Charcoal Plates—Terne.	
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Guaranteed Plates command special prices, according to quality.

Dean Grade.—IC, 14 x 20.	6.75
20 x 28.	11.00

IX, 14 x 20.	6.50
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20 x 28.	13.00
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IX, 14 x 20.	5.65
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20 x 28.	10.75
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IX, 14 x 20.	6.50
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20 x 28.	13.00
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Tin Boiler Plates.	
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XXX, 14 x 28.	112 sheets.....	... \$13.35
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XX, 14 x 28.	112 sheets.....	... \$14.00
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XX, 14 x 28.	112 sheets.....	... \$16.00
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Copper.

DUTY: Pig, Bar and Ingot, 1 $\frac{1}{2}$ ¢; Old Copper, 1 $\frac{1}{2}$ ¢. Manufactured (including all articles of which Copper is a component of chief value), 8 $\frac{1}{2}$ ad valorem.	
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Ingots.

Lake. 11 $\frac{1}{4}$ ¢
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Ansonia Grade Arizona. 11 $\frac{1}{4}$ ¢
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Ansonia Grade Casting. 11 ¢
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Sheet and Bolt.

Prices adopted by the Association of Copper Manufacturers of the United States, December 5, 1890. Subject to a discount of 10% @ 20%, according to size of order.	
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Common High Brass: Wider than and including	in. 24	in. 26	in. 28	in. 30	in. 32	in. 34	in. 36	in. 38	in. 40
	26	28	30	32	34	36	38	40	42
To No. 20, inclusive....	.36	.39	.42	.46	.50	.55	.60	.65	.68
Nos. 21, 22, 23 and 24. ....	.37	.40	.45	.50	.56	.61	.66	.71	.76
Nos. 25 and 26. ....	.38	.41	.44	.49	.52	.57	.63	.68	.73
Nos. 27 and 28. ....	.39	.42	.45	.49	.53	.58	.65	.70	.75

Discount from List 10% to 25%.

Brass and Copper Wire.

List January 17, 1892.

Numbered by Stubs' gauge.	Soft and hard high brass.	Spring high brass.	Low brass.	Copper.
All Nos. to No. 16, inclusive.....	\$0.22	\$0.24	\$0.26	\$0.30
No. 17 and No. 18. ....	.23	.25	.27	.31
No. 19 " " 20. ....	.24	.26	.28	.32
No. 21, or 0.032 diam. ....	.25	.27	.29	.33

Discount 10% to 25%.

Fine Numbers.

Numbered by London gauge.	Brass.	Spring high brass.	Low brass.	Copper.
No. 22.	\$0.26	\$0.28	\$0.30	\$0.34
No. 23. ....	.28	.30	.32	.36
No. 24. ....	.30	.32		